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Issue No 5

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The Aviation Historian®

The modern journal of classic aeroplanes and the history of flying

Editor's Letter

TAH IS OFFICIALLY a year old, so welcome to our fifth issue! While not specifically themed, it certainly has a thread running through it — the movement of people and goods across the British Empire in war and peace.

Mary Garden's compelling chronicle of her father's epic Croydon—Sydney solo flight in 1930, and Phil Vabre's vivid description of a Qantas Empire Flying Boat forced down on a Java river while coming the other way, both show how the needs of empire — right or wrong — fostered continuous growth and development during the fledgling years of commercial aviation. The effect of sustaining remote posts of empire was not just a civil matter either; Jonathan Pote and Ben Dunnell relate the challenges of projecting military air power over long distances with their respective features on the RAF's very-nearly-disastrous circumnavigation of the world by Vulcan in 1959 and the USA's proposed offer of help with hardware during the Falklands War.

Aviation has always played a vital part in sustaining communities, whether sending warplanes or Christmas cards across the world. Talking of which, as our next issue is not published until January, may I be the first to wish all our readers everywhere a very happy Christmas and prosperous new year!

FRONT COVER A glorious photograph of Short S.23 Empire Flying Boat G-ADUT Centaurus arriving at Wellington Harbour, New Zealand, on New Year's Eve, 1937. G.ALEXANDER TURNBULL LIBRARY, NZ

BACK COVER FROM TOP Avro Vulcans of No 617 Sqn at Farnborough, 1960; A Republic F-84F Thunderstreak of the 81st Fighter Bomber Wing; Oscar Garden's D.H.60M Moth Kia Ora; Sea Harriers aboard the USS Eisenhower; Hawker Hurricane G-AMAU.

NEW!

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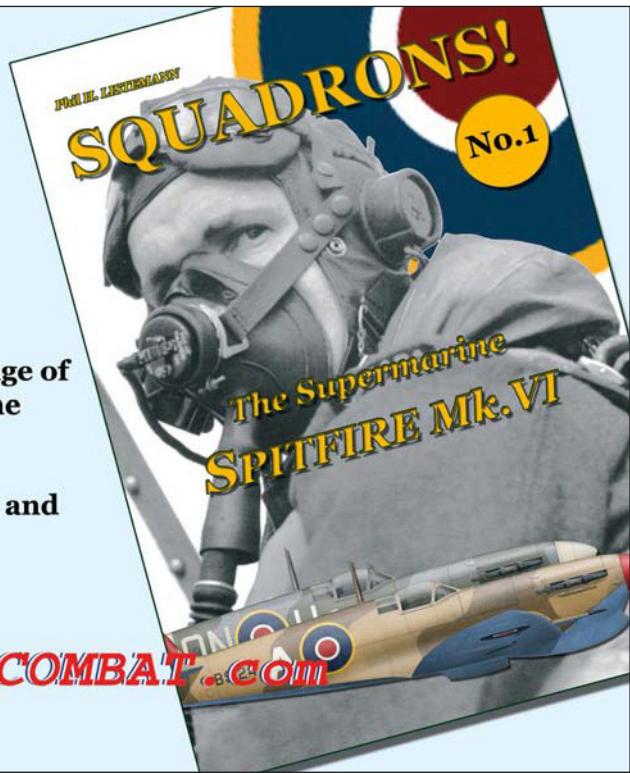
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AIR correspondence

Letters to The Editor

How to hand-swing a turboprop

SIR — Having read Issue No 2 I feel compelled to comment on your Laos item, *Anything, Anywhere, Anytime: Professionally* (actually pretty amazing that you've got such a story into print).

When I was chancing my arm at Shorts on Skyvan development I worked with a wonderful guy, Gilbert Poitier, Turboméca's rep for the less-than-successful Astazou IIIs fitted to the Skyvan. His previous posting had been to Indo-China on Astazou IIIs as fitted to the Pilatus Porter.

While there, the engine reliability was such that he frequently accompanied aircraft "behind the lines" just to make sure the task was completed successfully should an engine problem arise.

Well, one day it did, when the starter on a Porter burnt out "up country". Gilbert's solution was to hand-swing the turboprop!

Now the starting procedure normally is to use

the starter to turn the engine over until 10 per cent is seen, then turn on fuel and igniters. On a piston engine you hand-swing over a compression once, but on a turboprop at 10 per cent the blades are a blur, so you can't see the individual blades passing to give them another push. Gilbert said that you could just about manage five per cent, at which point you had to turn on the fuel and igniters, hope for the best and ignore the inevitable start-up over-temperature. Is this a first? Anyway, it worked and he lived to tell the tale (literally).

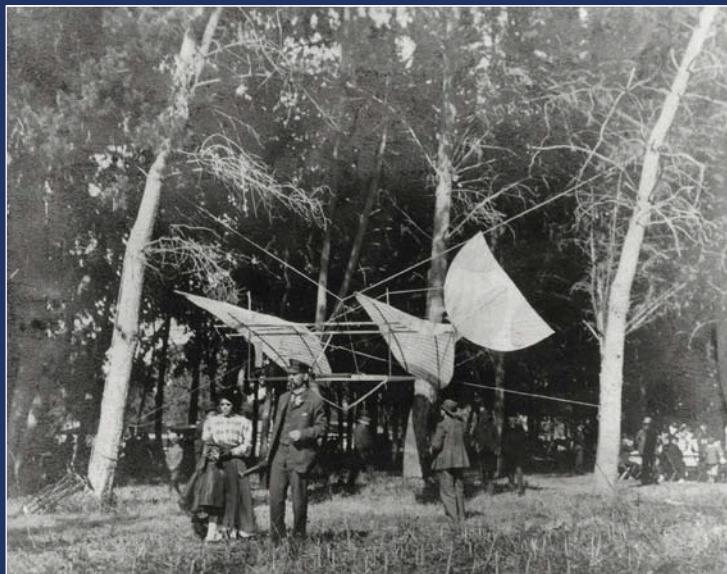
The same failure occurred to us on a Skyvan one day. As changing a starter would have meant cancelling the rest of the flying programme for the day, we windmilled the starterless engine on the runway, turned round and took off. All in a day's work.

Graham Skillen North Cheriton, Somerset

Gustave Whitehead postscript — that mystery photograph ...



Updating Mick Oakey's article
History or Hogwash? in TAH4, the "mystery photograph" ABOVE, on which John Brown based much of his case for Whitehead having flown before the Wrights, appears entirely unrelated to Whitehead. It bears an inarguable resemblance to the photograph at RIGHT of John J. Montgomery's glider The California, taken on May 21, 1905, at San Jose Agricultural Park in California. This image appears to be from the same sequence, taken from a viewpoint a few feet further right, to judge by the positions of the tree trunks. Lots more on this at www.flyingmachines.org/gwinfo.





Send readers' letters for publication to: *Air Correspondence, The Aviation Historian, PO Box 962, Horsham RH12 9PP, UK, or (preferably) e-mail them to the Managing Editor at mickoakey@theaviationhistorian.com*

Choosing what to believe

SIR — I read with interest Mick Oakey's article *History or Hogwash?* from *TAH4*, as reprinted online by www.wright-brothers.org. It was a nice mix of historical detail and common sense.

Having had an e-mail exchange with a very upset Mr Brown after I wrote an article on the Connecticut/Whitehead/Wright fiasco for our website on June 13, 2013 (www.scientificamerican.com/article.cfm?id=recent-bill-connecticut-proclaims-gustave-whitehead-first-fly-not-wright-brothers), I find that the most interesting aspect of the question is not whether the quixotic quest to promote Whitehead can succeed, but how, as Mick put it so very nicely, these weeds continue to grow. I especially liked his use of the quote from Giles Wood.

I tried, for instance, to point out to Mr Brown that our January 1906 article states "No photographs of this or of larger man-carrying machines in flight were shown", but he waved aside such picayune details.

We had an article from July 2011 by our sceptical columnist that sheds interesting light on Wood's comments on belief — see www.scientificamerican.com/article.cfm?id=the-believing-brain.

Dan Schlenoff Senior Copy Editor,
Scientific American, New York, NY, USA

Firefly flashbacks

SIR — Following the article in *TAH2* on Swedish Fireflies (*New Tricks for an Old Seadog*), I thought you may be interested in some of the photos of the ferry crew who delivered Skyfame's TT.1, SE-BRD. One picture shows the ferry crew upon arrival at Staverton being greeted by my father.

Also, I have in my possession three photographs of the recovery of TT.1 SE-BRL following

RIGHT Top to bottom: Skyfame Aircraft Museum founder Peter M. Thomas welcomes the ferry crew of Swedish Fairey Firefly TT.1 SE-BRD/G-ASTL to Skyfame's base at Staverton on May 28, 1964; three stages in the recovery of TT.1 SE-BRL following its ditching off Halmstad on September 28, 1963. See the letter headed *Firefly flashbacks* on this page.





AIR correspondence

its crash in September 1963. The pilot, Tage Pallér, told my father he was trapped in the upturned aircraft and would have drowned but for the actions of his Observer, Kenneth Sköld, who, armed with a fire-axe, broke his way into the front cockpit and was able to drag his friend out.

I would also like to congratulate you on a first-class magazine!

Ray Thomas via e-mail

Myth of the Spitfire's wing

SIR — I have welcomed the appearance of your new magazine *The Aviation Historian*, with its serious and documented historical attitude, providing a wealth of unpublished information, and combining the description of historical and operational data with some insight on the technical and construction details. An excellent and well-balanced publication.

Following your positive review (in *TAH1*) I thus bought and read Lance Cole's *Secrets of the Spitfire*, which you strongly recommended despite a number of annoying "avoidable and careless errors". Not only did I find the errors you mention, but many, many more, including embarrassing platitudes, numerical errors and meaningless statements, such as "The Spitfire fighter specification had a tactical [sic!] Mach number of about Mach 0.84" (p.114) or "the Supermarine B.12/36 . . . was a delta-winged heavy bomber" (p.185). A wealth of reference documentation is listed at the end, but the author has clearly no clue of what he is talking about and goes on rambling for 250 pages with totally unreliable data on which he formulates childish comments and incompetent judgments. The figures quoted are frequently irrelevant or misunderstood, when not misprinted (the Spitfire drag coefficient is repeatedly quoted as 0.21, whereas the correct value is 0.021).

The book's hero, Mr Beverley Shenstone, was undoubtedly a gifted and competent engineer, but certainly not the aerodynamic guru depicted by Cole, who attributes almost every conceivable

aerodynamic advance to Shenstone's mind. Such a messy and incompetent eulogy harms his memory, rather than underline his achievements.

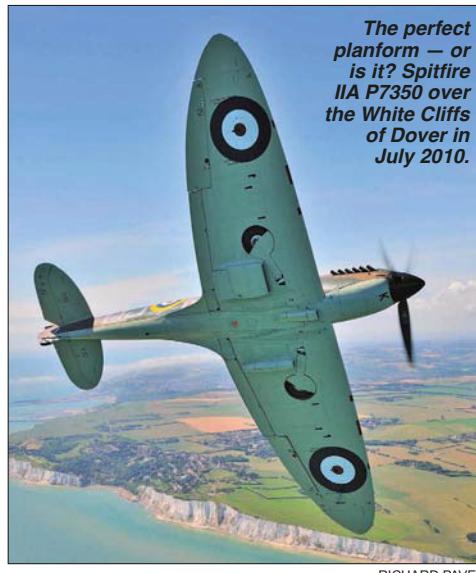
But the purpose of this letter is also to dispel the long-standing myth of the superiority of the Spitfire elliptical wing ("the mystical ellipse" in Mr Cole's words), undoubtedly the most graceful and recognisable feature of this great aircraft. In reality, its advantages over a straight tapered wing are absolutely negligible.

As we all know, in subsonic flight, drag is due to aircraft shape (form drag, due to skin friction, body shape, interference and protrusions, and virtually independent of incidence) plus induced drag (drag due to lift, proportional to the square of the lift coefficient, and inversely proportional to the wing aspect ratio). Induced drag is therefore highest at low speeds and high altitudes, and decreases greatly at the high speeds typical of fighter aircraft. It can be minimised if lift distribution along the span is elliptical, as shown by Prandtl in the early 1920s. This led to a number of elliptical-winged aircraft, including the Spitfire. But an elliptical wing, besides being more complex and costly to manufacture, also sports some undesirable characteristics owing to the fact that it stalls simultaneously along the whole span, thus denying aileron control at the stall,

when it is most required. The remedy is to twist the wing to reduce incidence at the wingtips ("washout"), thus denying part of the drag advantage of an elliptical lift distribution. The Spitfire had a considerable washout of 2.5° at the tips.

Furthermore, a straight-tapered wing shows only moderate degradation of induced drag: for an aspect ratio in the range 4 to 6, typical of World War Two fighters, the increase is approximately 15 per cent (this degradation is called the Oswald factor).

For a Spitfire Mk V at maximum speed at sea level (300 m.p.h. — 485 km/h), the form drag coefficient (C_{D0}) is 0.021, and the induced drag coefficient (C_{Di}) is 0.000764, i.e. 3.5 per cent of the



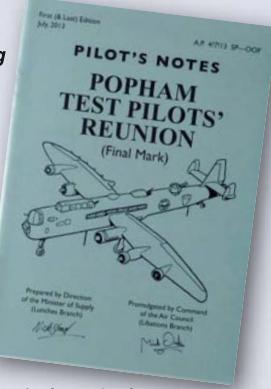
OBJECTS OF DESIRE

A few items of interest we think readers of TAH might perhaps wish to add to their Christmas-present list this year . . .

Instant collectors' item — TAH Pilot's Notes

WE CREATED This limited-edition booklet of test pilots' stories, ranging from the hairy to the hilarious, specifically for this year's Test Pilots' Reunion at Popham in July, which was to be the last such event after a 17-year run. We ordered just 500 of these A5, 36-page booklets from our printers, and we gave away 250 of them on the day. They were very well-received. We are now making the remaining copies available to TAH readers for £5 inc p&p in the UK (£6.25 Europe, £7.25 RoW).

■ Order via the Shop page of our website at www.theaviationhistorian.com.



WW1 aviation pin-ups for 2014

CROSS & COCKADE International's (CCI) wall calendar for 2014 is well up to the splendid standard that has come to be expected from this fount of First World War aviation history. Featuring 12 impressive paintings of a good variety of aircraft of the era, rendered by leading aviation artists including Terry Jones, Ken Farmer and Simon Smith, it would grace any study and is available for a mere £10 plus p&p (£1 for UK residents; £2.50 for EU/ RoW surface; £3 for RoW airmail). Profits from sales go towards upkeep of the British Air Services Memorial at St Omer.

■ Order from the CCI website at www.crossandcockade.com, or from CCI's Roger Tisdale at 11 Francis Drive, Westward Ho!, Bideford, Devon EX39 1XE.



Limited-edition bronze maquettes of the Bomber Command Memorial sculpture

A LIMITED EDITION of 20 maquettes based on Philip Jackson's Bomber Command Memorial in London's Green Park will be available in a new exhibition at the Catto Gallery from October 17 to November 12. It will be the first time any works based on the hugely popular public sculpture will be on sale to the public. Cast in bronze, the maquettes stand 21½in (55cm) high including the base, and are priced at £65,000 (sixty-five thousand) apiece. The Bomber Command Association, which commissioned the memorial, will receive a sizeable donation for each one sold. (The sculptor is seen at LEFT with a wax maquette.)

■ Catto Gallery, 100 Heath Street, London NW3 1DP; tel 020 7435 6660, www.cattogallery.co.uk. The exhibition is open 1000–1800hr Mon–Sat, 1230–1800hr Sun.

Aviation T-shirts with — at last! — a bit of style and wit about them . . .

DISAPPOINTED BY the generally unimaginative aviation T-shirts on offer in the shops, at events and online, aviation writer Rowland White has launched his own online shop called Project Cancelled. Why the name? "As a boy, a book called Project Cancelled, about all the exotic British aircraft designs that never made it, fired my imagination," says White, "enough that I ended up writing books like Vulcan 607, Phoenix Squadron and Storm Front. So time daydreaming about a future that never came to pass turned out to be time well spent." Alongside TSR-2 and Avro Arrow Pilot's Notes designs are ones inspired by real aviation history, and memorable aviation moments from cult movies such as Top Gun, The Wild Geese, Flash Gordon and The Avengers. A few combine fact and fiction: where geek worlds collide. Three of the designs are shown at RIGHT — there are lots more on the website: ■ www.projectcancelled.com.



**PROJECT
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PRIZE DRAW

THANKS TO PROJECT CANCELLED, we have three T-shirts to give away to TAH readers. For your chance to win one, e-mail mickoakey@theaviationhistorian.com, putting "T-Shirt Draw" in the header. Please include your name and address; you may choose any design from the range on the website, so please state your choice and size. Alternatively send your entry by post to T-Shirt Draw, The Aviation Historian, PO Box 962, Horsham RH12 9PP, UK. The first three drawn at random from all entries received by November 30, 2013, will win the prizes.



AIR correspondence

total. The same aircraft with a straight-tapered wing would have an induced drag increase of 15 per cent, increasing total drag by only 0.5 per cent, and causing a speed loss of less than 1 m.p.h.

Obviously at high altitude and lower speeds, typical of the climb phase, induced drag is higher: at 20,000ft and 200 m.p.h. (320km/h), C_{D_i} rises to 0.0095, i.e. 31 per cent of total drag. A straight-winged Spitfire would see its drag increase by 4.6 per cent, with a corresponding decrease in its rate of climb from 2,700ft/min to 2,600ft/min (13.7m/sec to 13.2m/sec). Max speed at 20,000ft would correspondingly decrease by 8 m.p.h. (13km/h) — a larger penalty, but hardly a game-changer. And in reality this decay would be even smaller, owing to the fact that the Spitfire wing, although elliptical in shape, does not in reality have an elliptical lift distribution because of its washout. Finally, the weight reduction of a simpler and stiffer straight wing would eventually reduce the difference to almost imperceptible levels.

So, the outstanding virtues of our beloved Spitfire are not due to its beautiful wing shape, but to the balanced design of all its components and to a fortunate and clever combination of low drag, control harmony and overall performance, which enabled its pilots to achieve the best results. A straight-winged Spitfire would most probably have achieved a performance level comparable with the elliptical-winged variant, with the additional benefit of greatly reduced manufacturing complexity and price.

It would, however, have lost the elegant and unique appearance that has endeared it to generations of enthusiasts ... ahhh, Spitfire!

Giulio Valdonio Milan, Italy

Partly-restored Moynet Jupiter F-BLKY at the 2013 Paris Air Show — see letter from Rod Simpson on this page. ROD SIMPSON

It'll fly, by Jupiter!

SIR — In Issue No 2 of *The Aviation Historian* you published my history of the Moynet Jupiter push-pull twin (*The Faster Skymaster*). Readers may be interested to hear that restoration of the M.360/6, F-BLKY, is well advanced at Angers Marcé in Central France and the aircraft was on static display at the recent 2013 Paris Air Show, as seen here. The restoration team at the Fondation du Patrimoine intends to make it airworthy and is seeking donations so that it can appear in the flying display at the 2015 Paris Show.

Rod Simpson Merstham, Surrey

[For more details see the FdP website (French language only) at www.fondation-patrimoine.org/fr/pays-de-la-loire-18/tous-les-projets-851/detail-avion-moynet-360-6-jupiter-n03f-blky-12967 — Ed]

How time flies . . .

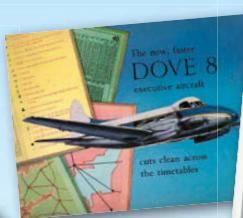
SIR — By chance I turned up some old 1960s copies of *Air Clues* this morning and my attention was drawn to a nice little (worn) gag in Wing Commander Spry's column (July 1968, Vol 22, No 10), whose more serious flight safety contents never fail to make me feel much older and also wiser!

Overheard in RAF Majunga, Madagascar: CO of Shackleton detachment to hotel proprietor: "Patron, your toilets are a disgrace; they are covered in flies!"

Hotel proprietor: "But m'sieu, you should wait until lunchtime — then the flies are all in the dining room!"

Roger Carvell Hitchin, Hertfordshire





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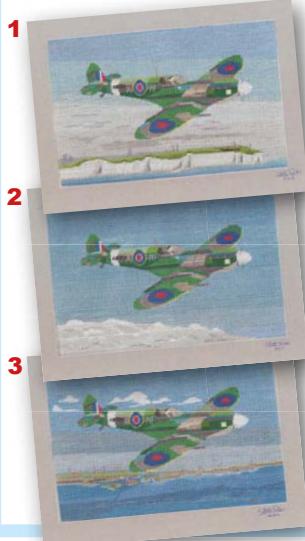
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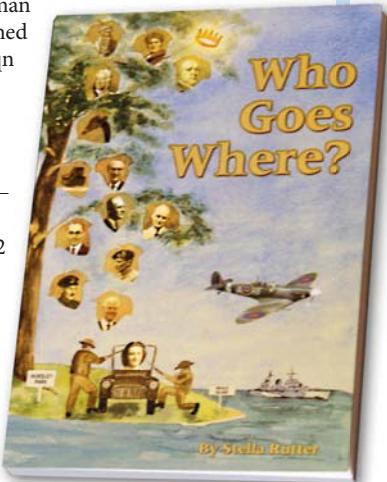
Stella Rutter Spitfire Tapestries & Book



FORMER WW2 Supermarine draughtswoman Stella Rutter has made a series of hand-stitched tapestries (left) featuring No 303 (Polish) Sqn RAF Spitfire Mk Vb AB183/RF-A, from an original painting by Pat Owen. Each one is available direct from her at £220 o.n.o. (+£48 if required silver-framed and glazed).

Stella's memoir/family history *Who Goes Where?* (right) is also available, for £9.99+£2 p&p. Order from: Stella Rutter, 31 Furlonge House, Emsworth House Close, Emsworth, Hants PO10 7JR; tel 01243 372746. Please make cheques payable to "Stella Rutter".

- 1 "Thank Goodness, The White Cliffs" (uttered by pilots returning after flight in fog).
- 2 "On Patrol" (above 20,000ft).
- 3 "Escape to the Baltic" (the Channel Dash — Scharnhorst, Gneisenau & Prinz Eugen).



OSCAR GARDEN

THE

SUNDOWNER OF THE SKIES



In the autumn of 1930 27-year-old New Zealander Oscar Garden was visiting relatives in the UK when he decided to learn to fly. With a mere 40hr of solo flying experience, he then set about flying his newly-acquired Moth to the other side of the world. His daughter, **MARY GARDEN**, tells the little-known story of her father's extraordinary achievement





OME 83 YEARS ago an unknown novice aviator by the name of Oscar Garden landed his secondhand de Havilland Gipsy Moth on a dusty airstrip in the far north of Western Australia, to become the fifth person to fly solo from England to Australia. It was November 4, 1930, and, at 27 years old, Garden was the youngest and by far the most inexperienced.

The following telegram was sent to England: "Arrival of Mr Oscar Garden after his solo flight from England was quite unheralded. It was not even known he was here until motorcar went to aerodrome on other business and found him overhauling his Gipsy Moth. He is proceeding to Sydney". *The Sun* newspaper, commenting on his casual arrival at Wyndham, said: "As Wing Commander Kingsford Smith has dubbed himself 'Vagabond of the Air' then Mr Garden should be known as 'Sundowner of the Skies'". (Sundowner describes a wandering Australian swagman who arrives out of nowhere at the end of the day.)

Some years later, in 1935, the *Isle of Man Weekly Times* said: "Mr Garden's flight ranks with those of Kingsford Smith and Bert Hinkler". The aviation magazine *Wings* in 1971 called it: "an intrepid piece of airmanship ranking with the achievements of such names as Kingsford Smith, Bert Hinkler, Amy Johnson, C.W.A. Scott and

ABOVE A souvenir postcard of Oscar Garden flying his de Havilland D.H.60M Moth, G-AASA, named Kia Ora, over Melbourne, after his epic flight from the UK to Australia in 1930.

OPPOSITE PAGE Kia Ora and its owner in New Zealand in late 1930. Garden acquired the Moth from keen aviator Harry Gordon Selfridge Jr, who went on to own a Comper Swift and a de Havilland Puss Moth.

IMAGES VIA AUTHOR UNLESS OTHERWISE NOTED

others who were making aviation history and blazing trails".

Yet, who has heard of this man and this feat? The only reason I know of him is that he was my father. Not that we got to know much of his past when we were growing up as he did not want to talk about it, and shunned publicity. I remember as a child the odd occasion he would shout "Bugger off!" at a journalist wandering up our long dusty driveway to seek an interview. He died in 1997 aged 93.

The England to Australia flight was one of Garden's many flying feats up to the late 1940s, when he suddenly turned his back on aviation and became a market gardener in Tauranga, New Zealand. But this particular flight in 1930 was the most memorable. In the early 1930s, flying from England to Australia was the longest flight in the world. It was considered extremely hazardous, pushing pilots to the limits of their mechanical skills and human endurance. Pilots



LEFT The author's father in Kia Ora before setting off on his remarkable 12,000-mile flight from Croydon to Sydney. Note the spare propeller carefully wrapped up and lashed to the side of the fuselage. Garden evidently had a great deal of faith in the Moth, as he took very few spares and tools along.

BELOW A D.H.60G Gipsy Moth in the distinctive red-and-black colours of the Brooklands School of Flying. Interestingly, Garden alleged that he went to Brooklands to see about learning to fly there, but found the instructors somewhat the worse for drink — perhaps he mistook the instructors' high spirits for spirits of a different kind.

had gone missing, crashed, got lost and even died in their attempts. Aviation was young and there were no aids; navigation was a do-it-yourself exercise by map reading and dead reckoning: no radio, beacons or search-and-rescue. To fly long distances required a high degree of flying and engineering skills, courage, and, usually, luck.

In July 1930, when Garden first had the idea to fly from England to Australia, only three aviators had made the flight: Bert Hinkler in February 1928 in 15 days; Francis Chichester over the new year of 1929–30 in 36 days and Amy Johnson in May 1930 in 19 days. Kingsford Smith set out on October 9, 1930 (a week before Garden was to leave), and reached Darwin on October 19, breaking Hinkler's record. Hinkler and Kingsford Smith were experienced pilots. Hinkler, at 36 years old, had ten years of flying experience; Kingsford Smith at 33 had been flying for 14

years. Johnson and Chichester had been flying for several years. All aimed to break records; Johnson's aim was also to be the first woman to make the crossing.

What makes Garden's flight extraordinary (or foolhardy) is that he was a novice pilot. He also had no intention of breaking any flying records — his flight was purely a business one. And unlike other aviators, he had had no childhood or adolescent dreams of flying.

EARLY DAYS

Born in Tongue in the far north of Scotland in 1903, Garden moved to New Zealand in 1920. After a series of jobs connected with motor vehicles he moved to Sydney and ran a garage. In 1930 he sailed back to Britain to visit relatives. Although he often told the story that on board he became friendly with an architect from Auckland who suggested that with Garden's



PHILIP JARRETT COLLECTION

D.H.60M MOTH DATA

background in the small motor business he should learn to fly, *The Sun* newspaper (November 5, 1930, p13) reported that in late 1929 he had taken a flight around Sydney Harbour with a Captain Les Holden, who recalled Garden's "extraordinary enthusiasm for aviation". *The Sun* claimed that Garden had often been out at Mascot Aerodrome "giving evidence of a tremendous keenness in aviation".

After buying a secondhand car and visiting relatives in Scotland, he bought his first aviation magazines and set out to investigate how to fly. There were three British schools of aviation that qualified for a government subsidy — £50 for each pupil who gained a private licence ("A" Licence). He first went to Reading Aero Club. It was about 1100hr. Garden, in a 1990 interview with Eric Tucker, said: "I saw several pilots, two of them instructors, all pretty high on the bottle. And I sort of looked around and I thought 'Blimey, I'm not so keen on learning to fly with these boys — not if they're like that at this time of the day'". So he investigated the Brooklands School of Flying in Surrey. The time was about 1300hr and, according to Garden, the three instructors "were even higher", putting him off learning to fly there. The following day he went to the Norfolk & Norwich Aero Club at Norwich. "There was only one instructor, Mr Bunning his name was, and I arrived at midday and there wasn't a sign of booze on the horizon anywhere and he certainly was a cold stone sober man, so I made some inquiries and it was going to cost 25 shillings an hour to get my A Licence, so I started straight away".

Within 18 days, after 12hr 20min dual instruction, Garden obtained his licence and was able to fly solo. He said later that all he learnt from Mr Bunning was how to take an aeroplane off the ground, keep it straight and level, do a mild turn

Powerplant 1 x 100 h.p. de Havilland Gipsy I or 1 x 120 h.p. Gipsy II air-cooled four-cylinder inline piston engine or 1 x 90 h.p. ADC Cirrus III air-cooled four-cylinder inline piston engine

Dimensions

Span	30ft 0in	(9.14m)
Length	23ft 11in	(7.29m)
Height	8ft 9½in	(2.68m)
Wing area	243ft ²	(22.58m ²)

Weights

Empty	962lb	(436kg)
All-up	1,750lb	(794kg)

Performance

Maximum speed	105 m.p.h.	(169km/h)
Cruise speed	85 m.p.h.	(137km/h)
Initial climb	700ft/min	(213m/min)
Service ceiling	18,000ft	(5,485m)
Normal range	320 miles	(515km)

and come back and land. His sights were now on obtaining a commercial licence, which in those days needed 100hr of flying time (at £5 an hour) plus a few comparatively simple exams. Then he came up with the notion of flying to Australia. He told Eric Tucker in 1990: "So the idea germinated that if I bought a 'plane to get my 'B' Licence, it would be cheaper than doing it all through an aero club, because it wasn't subsidised, you see. And then I thought, well, if I was going to do that, why not buy a 'plane and try and fly it to Australia and then I could get some experience and at the end have enough hours to qualify for a commercial licence".

Which is just what he did.

FINDING "KIA ORA"

Garden went hunting for a secondhand aircraft. He found metal-fuselage D.H.60M Gipsy Moth G-AASA (c/n 1438) — which had already seen

Gipsy-engined D.H.60M Moth G-AASA in New Zealand in late 1930 or early 1931. The aircraft had originally been registered in the UK on November 9, 1929. Following the England—Australia flight it was transported by ship to New Zealand.





many hours of flying — in Selfridges, London's famous department store. The blue-coloured machine had belonged to Gordon Selfridge Jr. With a bit of arm-twisting he managed to trade in his old Chrysler car for £50, to add to another £450. The aircraft was moved to Brooklands and Garden began preparing for his flight to Australia. He named his plane *Kia Ora* — Maori for "good luck".

He was now short of funds but saved £18 by making his own maps. He explained to Tucker: "I was pretty broke before I left and tried to economise by making my own maps. So I went round scouring London for bits of strip maps and I spent half the night putting them together and marking out distances, and when I studied them I noticed that the over-water distance between Koepang [now Kupang in Indonesia] and Darwin was much further than going direct to Wyndham [Western Australia] and I was all for cutting down the distance over the water, being a novice. It was a silly thing to do because I had an awful trip after that to get to Alice Springs". (Johnson, Hinkler and Kingsford Smith had all flown to Darwin).

Garden's first flight in *Kia Ora* was on September 12, 1930. Over the next month he flew cross-country flights to Manchester, Edinburgh and Blackpool to improve his navigation and flying skills. He also learnt how to read a compass. An extra fuel tank was placed in the luggage compartment behind the rear cockpit, with a hand pump (40 strokes per gallon), to give a range of about 800 miles (1,300km). His suitcase, tools and spares were loaded in the front cockpit, which had its windscreen removed and was faired over with a plywood cover. A spare propeller was secured along the fuselage side, lashed to the centre-section struts. He decided to take the minimum of spares: two valve springs and valves.

Previous long-distance pilots had been sponsored by Shell Oil but Garden had been connected with the Vacuum Oil Company when he was running his Sydney garage, and so he approached the London office for assistance. Vacuum obliged and agreed to provide fuel supplies at all the planned stops along the 12,000-mile (19,000km) route. On October 15 Garden pre-positioned for the big flight, flying the Moth from Stag Lane to Croydon.

He sought no publicity and the only press mention was a short piece in one of the national papers the day he left, October 16: "A light aeroplane landed at Croydon yesterday afternoon and from it stepped a young man who announced his intention of starting at 4 a.m. today, on a flight to Australia. After stating that his name was Oscar Garden and that his home



ABOVE The reluctant pioneer — Garden had no ambition to become a standard-bearer for long-distance aviation achievements, but merely wanted to get his machine back to the Antipodes while accumulating flying hours to go towards the 100hr of flying time required for a commercial pilot's licence.

was in Christchurch, New Zealand, he climbed back into his machine and flew away. Aerodrome officials have no idea where he came from".

"HE HASN'T A HOPE IN HADES"

Garden set off early in the morning of the 16th, witnessed only by a representative of the firm backing him. Even Bunning, his flying instructor, knew nothing of his plans. When Bunning found out later he criticised it as: "... a foolhardy action. He doesn't have a hope in Hades". He had a point. Garden had been flying for only three months and had a mere 40hr solo flying experience. His longest flight had been about 5hr.

In later interviews Garden claimed he kept his plan secret from his family and friends as he did not want to be talked out of going, although a newspaper later reported that his mother told them she had made an unsuccessful 11th-hour attempt to dissuade her son. She was particularly worried that he was not carrying a hat and had only a dozen sandwiches.

Garden had a bad start. Poor weather and fog forced him down at Lympne, near Folkestone, and so his official departure from England was not until the next day, the 17th, when he set off again. By the time he reached Munich, Germany, he began to question whether the whole thing was such a good idea. When it was time to leave

Kia Ora at the new de Havilland plant at Mascot airfield in Sydney in late 1930, the company having moved operations from Melbourne earlier in the year. Garden's flight was naturally a fine advertisement for the Moth's dependability and ruggedness.



“OSCAR’S MOTHER MADE AN ATTEMPT TO DISSUADE HER SON; SHE WAS WORRIED THAT HE WAS NOT CARRYING A HAT AND HAD ONLY A DOZEN SANDWICHES . . . ”

Munich, the journey almost ended there. Before take-off, he had to swing the propeller by hand. When he began to do so, however, he was unaware that the throttle was wide open. In an article Garden wrote for the New Zealand *Free Lance* newspaper (December 3, 1930) he said: “I am usually very careful, so perhaps the accident may have been due to someone else’s mistake; one of the curious bystanders may have fiddled with the controls”. Whatever the reason, the aircraft suddenly “became alive, plunging and bucking like a runaway horse”. He was knocked to the ground, but with bystanders managing to hold “this bucking bronco”, he clambered aboard via a wing and switched the engine off. The German police tried to persuade him to remain a day to rest but after an hour they let him continue to Salzburg in Austria. His flying time that day totalled 9½hr.

The following day he flew via Belgrade to Sofia in Bulgaria, where he had the first of several encounters with passport authorities. He was held up for four hours because his passport allowed him to enter the country but not to leave. Evidently other aviators had faced similar difficulties, although Kingsford Smith avoided such trouble by flying via Rome. (Garden commented that the British Air Ministry’s arrangements — for which he had paid £18 — were “by no means perfect”. Apart from passport prob-

lems, the Ministry gave him the wrong location for five aerodromes). From Sofia, Garden flew to Constantinople on the 19th.

On October 20, after flying for only 3hr, engine trouble forced him to land on a Turkish military airfield near Eskişehir. But because his passport did not allow for him to land on a military aerodrome, he was stuck there for the rest of the day.

The next leg of his journey was to Aleppo in northern Syria, a 7hr flight. Owing to wrong directions he ran out of fuel and had to make another forced landing ten miles (16km) south of the town, near a railway line. After tramping for 2hr in the desert heat to a telephone (manned by an Arab policeman), it took another four hours before he could talk with somebody who could speak English. Eventually a man arrived with a little oil and petrol. When Garden returned to the Moth he found it surrounded by about 200 Arabs, “who were scared stiff and afraid to go near it”. He sat down and tried to indicate through sign language that he was thirsty but they kept bringing him hard-boiled eggs.

THE MIDDLE EAST AND INDIA

His flight to Baghdad on the 22nd was incident-free but the following day, shortly after leaving, he ran into a severe sandstorm and had to land at Bushire (now Bushehr) in Iran. He ended up



The Hon Mrs Victor Bruce (Mildred Petre) shakes hands with Oscar Garden alongside her Blackburn Bluebird IV, G-ABDS, named Bluebird, at Jask on October 25, 1930. The pioneering aviatrix was on her way to Tokyo, which she reached on November 24.

staying the night in the same house where Kingsford Smith had stayed during his record-setting flight just ten days earlier. He then flew to Jask in the Gulf of Oman where he met The Hon Mrs Victor Bruce on her way to Japan (she had previously been lost in the desert) and the following day they flew in tandem to Karachi in northern India (now Pakistan).

On October 26 Garden headed east to Jodhpur and on to Jhansi in northern central India in the face of strong headwinds. After flying for 11hr 40min he experienced a near-disaster. He had been given wrong directions for Jhansi aerodrome and circled around for about 30min in the hope of signals. Finally he ended up crashing in darkness between two trees in a ploughed field. The Moth overturned, smashing the propeller and damaging the rudder. Garden was hanging in his straps, listening to petrol dripping out.

By using sign language he was able to get some locals, who had rushed to the scene, to help him right the aircraft by first removing its wings from one side. Then the wings were replaced and the spare propeller installed. Garden sat under one wing and waited for daylight. He was hungry, but every time he motioned for food, one of the Indians would give him some "vile" *beedi* cigarettes. He was cut, bruised, tired and stiff.

His companions must have seen that he was stiff, because suddenly a couple of them rolled him over and proceeded to give him a vigorous massage, which, he said, "despite its roughness, really did me a lot of good".

At about 0500hr on the 27th torrential monsoon rains hit and in minutes the field became a bog. It took several hours for about 50 Indian helpers to tow the machine with ropes to a relatively dry strip. Numerous trees in the way had to be cut down. Garden made repairs to the Moth as necessary before flying to Allahabad, possibly on the same day, and on to Calcutta on the 28th. *The Straits Times* was there to report on the matter: "'I must have been born lucky' cheerfully observed Mr Oscar Garden as he jumped out of his aeroplane at Dum Dum Aerodrome this evening". Further repairs were undertaken at Calcutta on the 29th.

On October 30 Garden set out again, flying from Calcutta to Rangoon in Burma via Akyab (now Sittwe), before heading south for Singora (now Songkhla) in southern Thailand on the 31st. Over the next two days Garden flew to Singapore and on to Batavia (now Jakarta) on Java. On November 3 he turned east again, heading for Sourabaya and Bima on the island of Soembawa (now part of Indonesia), where he



again had incredible help from locals, this time from a tribe reported to be headhunters.

As usual, after arriving, Garden did his maintenance work on *Kia Ora*, and in an interview some years later recalled: "I was up there, getting one of the natives to stand beside me with a torch while I checked all the gear. I was dead tired and I was being eaten alive by mosquitoes. I got on top of the engine and had a look. And I found two broken valve-springs and I was just dead lucky that I had two spare ones. So I finished up by replacing them and getting it sorted out". If he had not made the repair, he most likely would have ended up in the shark-infested Timor Sea.

At midnight he was taken to the chief's hut, where he was fed. He tried (with sign language) to convey to the chief to wake him up at 0400hr, even shaken awake if need be. In the early morning of November 4 he was startled to find about 50 locals sitting on rope beds that had been placed all around the Moth. "I couldn't take it in, that they would guard the 'plane like that. And I thought, my God, what a marvellous thing to do!

"When it was time to say goodbye, they gave me something quick to eat for breakfast, goodness knows what it was. I had about £10 in different currencies left. I knew if I came down in the Timor Sea that would be the end of that, I'd be gone, so I thought it better for the chief to

have it. I gave him this money and I sort of pointed to all the villagers and he nodded his head; he knew what I was talking about."

ACROSS THE TIMOR SEA

After flying to Koepang to refuel, he braced himself for the 500 miles (800km) over the Timor Sea. With great relief he reached Wyndham, Western Australia, at nightfall on the 4th after 12½hr in the air. Nobody was expecting him. He had completed the England to Australia flight (12,000 miles — 19,000km) in 18 days, of which 14 were actual flying days, beating Amy Johnson's record. It was a new record for a novice pilot and the third-fastest time. Not that such considerations had been on Garden's mind.

In the early evening Stanley Brown, a pilot for Western Australian Airways (WAA — which had a twice-weekly run to Perth), heard the sound of an aircraft overhead and quickly drove out to Wyndham airstrip. He was stunned to find Garden standing on a drum doing his engine maintenance. My father spent the night at the Blazing Stump Hotel and *The West Australian* newspaper reported that he was very tired after his "long and anxious day" and went to bed soon after having dinner. He claimed that he had he had not been scared "but every aviator coming to Australia must have a certain amount of dread of the long, lonely flight over the Timor



ABOVE Garden's arrival at Mascot on November 7 after his final 1,100-mile leg from Broken Hill. The intrepid airman had sent a telegram from Broken Hill the previous day, announcing his intention to arrive in Sydney at 1500hr. True to his word he arrived overhead the city at the appointed hour, to be greeted by a sizeable crowd.



ABOVE Garden (fourth from right) is feted by local dignitaries on his arrival at Mascot. Second from left is Vacuum Oil representative Capt Fred Haig, who looks rather dubiously at the sunburned young aviator. In flying helmet is Les Holden, who reputedly gave Garden his first taste of aviation with a flight around Sydney Harbour in 1929.

Sea, which had to be undertaken at the end of the trip". That day's flight, he said, was often in mind right from the start.

"I WAS BURNT TO A CINDER"

Garden still had to fly across Australia to reach his final destination, Sydney. The pilot for WAA was flying back to Perth the next day so accompanied him to Halls Creek, a couple of hours south of Wyndham. Before they left the pilot evidently told Garden he was "stark staring mad" to attempt to fly across the central saltpan desert to Alice Springs.

Garden remembered: "He was quite right too, because it was an absolute nightmare. I mean it was a suicide trip really. And I was damned lucky to get to Alice Springs, I can tell you. It was a long day, 12hr 5 min. And one of the biggest jokes — it shows you what a novice I was and how lucky I was, I suppose, or how green I was — was that I hadn't even any water aboard, leaving Wyndham to go across this damned desert. This pilot said: 'You're mad anyway but for God's sake take some water!'

"So he dug up half a dozen empty beer bottles from somewhere and we filled them with water. I put them into the front cockpit. I put them there in case I was forced down. Well from then on, before I got anywhere near to Alice Springs, I

was burnt to a cinder. There was hardly any visibility as I was flying through a red dust storm practically the whole way, and I had to stick my head over the side to see anything. I was burnt and gasping for water and all my damned water was in the front cockpit — I couldn't even reach it!"

It was known that he was coming to Alice Springs and bonfires had been lit to guide him to the airstrip. He had completed the first aerial crossing over the heart of Australia, including the Great Sandy Desert, across some of the most treacherous country in the world. The previous year, in March 1929, two pilots, Keith Anderson and Bobby Hitchcock, had died there. They were searching for Kingsford Smith and his crew who had been attempting to fly from Australia, to England, but became lost near the north-western coast of Western Australia.

The next day Garden flew to Broken Hill, a flight of 9hr 10min, which he said was "a piece of cake after the day before". At Broken Hill he sent a telegram: "Arriving Sydney 3 o'clock".

On November 7, Garden flew non-stop to Sydney, a trip of 8hr 5min, arriving there just before 1500hr. Half a dozen aircraft from the Mascot Aero Club flew out to meet him. A large crowd was waiting including the representative from Vacuum Oil, Capt Fred Haig. In a later interview

Garden recalled: "At this big reception at Mascot, Haig had this quizzical look, for here's me holding a big bunch of flowers looking like a sissy, and I'm burnt to a cinder with a silly grin on my face. Fred was looking at me out of the corner of his eye wondering what on earth he's struck! I was like a kid, a complete novice".

THE AFTERMATH

My father's flying days did not end there. In fact he was one of the few pioneer aviators of that era to survive and continue in commercial aviation. When he travelled to New Zealand, he received a hero's welcome and, after a tour of the country, decided to capitalise on the publicity and take people for "joyrides". From January to April 1931, he gave rides mostly in the South Island, where his parents had moved from Scotland some years before. Rides lasted about 10min and cost 12s, a sizeable sum at the time. The country was in the grip of the Great Depression, but clearly those who could afford it were willing to pay for brief thrills. More than 1,000 people were daring enough to go up with my father.

In mid-1931 Garden returned to England to refine his instrument-flying skills and learn aerobatics. He went on to do pleasure- and airshow flying throughout Africa and the Middle East for several years. In 1935 Garden became a pilot with United Airways Ltd (which in October that year was amalgamated into British Airways) and stayed until September 1938, when he transferred to Imperial Airways and did the flying-boat conversion course. In April 1940 he delivered Short S.30 Empire class flying-boat G-AFCY from England to Auckland via Australia for the New Zealand-based airline Tasman Empire Airways



ABOVE The official address given to Oscar Garden by Mayor David Alexander of Mascot on the former's arrival at Mascot on November 7, 1930. The citation praises Garden's "indomitable pluck and persistency" during his epic flight from England to Australia. When asked to say a few words after the official speeches, Garden later claimed he was "completely tongue-tied".

"YOUR DEPARTMENT STORE SELLS GOOD AEROPLANES"

FOLLOWING OSCAR'S arrival in Sydney several functions were put on including a luncheon at the federal parliament house. As Garden was penniless and had no suitable clothes, Vacuum Oil representative Fred Haig bought him some new ones, including a few suits, and gave him a crash course in public speaking. He told Garden always to start with a joke. Telegrams poured in. One was from D.A. Alexander, the mayor of Mascot, Sydney, which read: "I extend a hearty welcome to you on your return to Australia and safe landing at Mascot Aerodrome, after your flight from England, and congratulate you upon the indomitable pluck and persistency shown by you throughout the flight". Another from the Governor of New South Wales, Philip Game, said: "I would like to avail myself of this opportunity of also offering you my most cordial congratulations on your flight. From what I have read in the press your adventure was full of incidents that called for an unusual display of initiative and courage and I rejoice with you in your great accomplishment".

From New Zealand came two telegrams, one from the Governor, General Bledisloe, who said: "I send you warmest congratulations on your courage and successful flight, which has created intense admiration throughout New Zealand". The second, from the acting prime minister, E.A. Ransom, read: "Government of New Zealand wish [sic] to congratulate you on your wonderful achievement". The Australian controller of civil aviation, Horace Brinsmead, sent the following: "Heartiest congratulations success attending your flight to and through Australia. This very fine achievement deserves commendation highest terms". There were also a number of telegrams from Scotland and the speaker of the government of the Isle of Man suspended business for an afternoon and his old high school in Douglas flew the Union Flag above the school in his honour.

In the middle of all this unexpected fuss and attention (which he found quite unnerving) Garden remembered to send a telegram to London to Selfridges which said: "Your department store sells good aeroplanes!"

Kia Ora at an airfield in New Zealand after it had been transported by ship across the Tasman Sea. The Moth retained its UK registration until March 1931, when it was put on the New Zealand civil register as ZK-ACK. The following May, it was sold to a new owner, Mr T. Mullen of Hamilton in the North Island, who sold it to Mr M. Scott, also of Hamilton, in May 1933. Four months later it moved on to the Auckland Aero Club, which flew it until December 1937, when it was sold to the Waikato Aero Club. It went on to be impressed into RNZAF service in 1939 as NZ510; it served with No 2 EFTS at New Plymouth before being used as an instructional airframe by Whangarei Air Training Corps from 1941. It was eventually broken up at Hobsonville in June 1946.



RIGHT Oscar and a passenger beside Kia Ora at Rotorua in 1931. Garden's pleasure-flying business in New Zealand thrived, but in mid-1931 he returned to the UK to undertake further training. He attended Air Service Training at Hamble in the summer of 1931, winning the blind-flying trophy for that year, before joining John Tranum's flying circus to work extensively in Africa and the Middle East.

BELOW In 1935 Garden joined the newly-formed United Airways Ltd, which provided services between London, Blackpool and the Isle of Man. Garden flew the airline's Dragon Rapides, which were absorbed into the British Airways fleet on amalgamation with other airlines in late 1935.



Ltd (TEAL), with which it became ZK-AMC. Three years later he became the company's chief pilot and operations manager.

Although they were beautiful to look at, my father came to dislike flying-boats, and described flying them as "hellish". He believed they were not designed for long distances, especially over water, and in the early years, "these 'planes gave us no end of trouble; we had an awful lot of bugs to iron out". In a 1977 letter to his sister he wrote: "Had hundreds of near misses over the years and am damned lucky to be alive. I lost count of the number of times, even on the Tasman".

RESIGNATION & RETIREMENT

In May 1946 my father was passed over for the position of General Manager of TEAL and Geoffrey Roberts was appointed instead. Roberts

made the decision to replace the S.30s with Short Sandringham IV flying-boats, overriding the preference of my father and other senior personnel for the much more modern — and land-based — Douglas DC-4. In 1947 my father resigned from TEAL and severed all ties with aviation. Ronald Puttick, who was recruited by my father in 1946, told me that he did not consider Geoffrey Roberts to be the "father of TEAL/Air New Zealand" as he is often described. Puttick recalls that my father was held in awe and respect, and even in reverence, within the company. As a highly capable pilot, a top captain, he would not have liked anyone issuing him with orders or criticisms; from his own past performance he was his own boss. Any prospect of not being his own boss would have been quite unacceptable to him. In his





ABOVE An extremely rare unused souvenir flight ticket for Garden's pleasure-flying activities during 1931. Flights were very popular, passengers ranging from children to 75-year-old grandmothers.

RIGHT Oscar helps a passenger disembark from a British Airways Dragon Rapide at Liverpool in 1936. Two years later he would join Imperial Airways and train to become a pilot on "hellish" flying-boats.

book *Airline: The Making of a National Flag Carrier* (Shortland Publications, 1979) Ian H. Driscoll wrote: "It was Garden who laid the foundations on which TEAL and Air New Zealand built a reputation for flight safety and operational proficiency which is renowned among world airlines".

For the rest of his life Oscar became a virtual recluse. My mother, who died in November 2012, often said he had "a lump on his shoulder" that coloured and soured everything. As well as his bitterness over the appointment of Roberts and the DC-4 issue, he had fought for years for pilots to get a pension. Pensions finally came in a year after he left the airline. Until his retirement he grew tomatoes in Tauranga on New Zealand's North Island. He never flew an aircraft again. Apart from his immediate family



(my mother and his three children) he had minimal contact with other people and hated socialising. He didn't even have much contact with us. He worked from home as a market gardener and spent long hours alone in his glasshouse tending his tomato plants, with the same dedication and attention (I now realise) as he once lavished on his precious Gipsy Moth, *Kia Ora*.



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In April 1940 Garden and copilot Christopher Griffiths delivered the 37th Short Empire flying-boat from Southampton to Auckland. Registered as ZK-AMC and named Awarua ("two rivers"), the aircraft went on to fly more than a million miles in TEAL service before being broken up in Auckland in August 1948.





*A study in blue and gold: Hurricane IIc
G-AMAU, The Last of The Many, above the
clouds during a photographic flight after the
aircraft's civilianisation in 1950.*

THE
RACING
YEARS

THE LAST OF THE MANY

HAWKER HURRICANE PZ865/G-AMAU, 1950-60

July 1944 was a significant month for Hawker Aircraft Ltd; it saw the closure of one of the most important chapters in the company's history, but the beginning of the story of a particular machine that would go on to spend more than six decades reminding the world of the numerous achievements of one of its greatest creations — the ubiquitous Hurricane. **NICK STROUD** details the "blue and gold years" of the last example built, during which it gained a royal racing pedigree and donned uniform to become a film star

ON JULY 22, 1944, finishing touches were applied to Hurricane IIC PZ865 at Hawker's factory at Langley, Buckinghamshire (now Berkshire), before the aircraft was rolled off the production line and taken for its maiden flight as per routine procedure. Except that this was not just any Hurricane. This was the 14,533rd — and final — example of Sir Sydney Camm's famous fighter to be built.

Appropriately, during its production the aircraft had been given the name *The Last of the Many* (perhaps a gentle dig at the name of the film describing the genesis of the Spitfire — *The First of The Few*), the aircraft having its new moniker painted on panels on both sides of the fuselage beneath the cockpit (see *I Built The Last Of The Many*, TAH3). Shortly after its first flight PZ865 was made guest of honour at a "christening" ceremony at Langley (as seen **BELOW**), marking the end of an era in which the Hawker fighter had proved itself one of the most valuable British

aircraft ever produced. Present at Langley for the party were representatives from Rolls-Royce, Rotol and de Havilland, the first having supplied the Hurricane's dependable Merlin engine, which drove the latter's various propellers. Fittingly, Hawker test pilot P.W.S. "George" Bulman, who had flown the prototype Hurricane in November 1935, was on hand to fly the last production example, dazzling the gathered Hawker workers with a polished aerobatic display that demonstrated why the type had become such an invaluable part of the RAF's inventory.

The last Hurricane's RAF career was extremely short; on December 7, 1944, PZ865 was bought back by Hawker. Surprisingly little seems to be known about the work the aircraft undertook over the next five years, some sources stating that it was stored for most of the period 1945–50. What is known, however, is that by early 1950 a decision had been made by Hawker to put *The Last of The Many* on the British civil register and use it for communications work and display flying — and



Resplendent in its new colour scheme of dark blue with gold registration letters, cheat lines and propeller spinner, The Last of The Many caught the crowd's eye at its first civilian outing, to the Royal Aeronautical Society's Garden Party at White Waltham on May 14, 1950.

ALL IMAGES TAH ARCHIVE UNLESS OTHERWISE NOTED



maybe even a bit of pylon-pounding in the popular post-war air racing circuit.

A report dated March 13, 1950, from the Works Supervisor at Langley, to Hawker's Chief Inspector at Kingston, Mr J. Lewis, states that the RAF logbooks for PZ865's engine and propeller were not with the aircraft at Langley (in accordance with Air Ministry procedure, these had been sent to the Archives in 1944 to be retained for six months, after which they had been destroyed) but that the history card for the work undertaken on the machine by Hawker while at Langley was fully up to date (sadly, this appears to have been lost). The report goes on to say that "the general condition of the aircraft is good, but signs of surface corrosion have appeared on steel parts", Lewis adding that "if it is intended to apply for a C of A [Certificate of Airworthiness] for this aircraft a considerable amount of work will be necessary depending on whether it will be classified as a prototype or a series aircraft to satisfy the requirements of the ARB [Air Registration Board]". Lewis then listed 12 requirements for work to be done to qualify it for civil operation, including the removal of all military equipment, a full overhaul, fuel-flow tests, the issuing of a weight schedule and the re-painting of the aircraft in civil colours and with its new registration, G-AMAU.

As the paperwork chugged through the various agencies responsible for issuing PZ865's C of A, the aircraft was painted in its tasteful new signature colours of royal blue and gold for its public debut at the Royal Aeronautical Society's Garden Party at White Waltham on May 14, 1950. Typically, the paperwork was delayed and a request for a Permit to Fly (along with five

shillings) was sent to the Ministry of Civil Aviation, which duly granted a two-day permit for transit and display flying. The May 18, 1950, issue of *Flight* noted that, "proud in its coat of Sopwith blue, with gold-bronze spinner and registration, *The Last of The Many* was beautifully shown off by Trevor Wade".

THE ROYAL SEAL OF APPROVAL

The full C of A was finally issued on May 23, 1950, the aircraft being registered as a prototype in the Special category, for the purposes of subsections (f), racing or record flying, and (h), demonstration flying. The aircraft's engine was a standard Merlin 20, the ARB insisting that it be fully inspected and signed off by a Rolls-Royce representative before the issuing of the C of A.

The following month a 12½gal (57lit) auxiliary fuel tank was fitted in each of the Hurricane's wings to extend the aircraft's range and in August the Merlin 20 was replaced with a Merlin 24, with the engine mounting and fuselage being stressed for the increased power.

Before the engine change, however, was the first opportunity to put G-AMAU through its paces on the air racing circuit. The first big race meeting of 1950 was to be held at Wolverhampton, where the King's Cup and Goodyear Trophy races would be contested over the weekend of June 17–18. The royal blue colour scheme of G-AMAU became particularly apposite when it was announced in April that HRH Princess Margaret would be sponsoring G-AMAU to be flown in the King's Cup by wartime Hurricane pilot Gp Capt Peter Townsend, Equerry to HM King George VI and the current beau of the young princess.

Three laps of the 100km (62-mile) quadrilateral



An extremely rare Dufaycolor transparency of G-AMAU at White Waltham on May 14, 1950, taken from beside the tail of Hawker's similarly-painted civil-registered Tomtit, G-AFTA. Unusually this photograph was taken from the starboard side, revealing that the legend, "The Last of The Many", was painted only on the port side in the initial iteration of the Hurricane's blue-and-gold scheme.

PHILIP JARRETT COLLECTION



Wait for it! — Gp Capt Peter Townsend waits the handicapper's starting flag to drop during the 19th King's Cup Air Race, held at Wolverhampton on June 17, 1950. At 36 years old, Townsend was a highly experienced fighter pilot and no stranger to the Hawker fighter, having commanded Hurricane-equipped No 85 Sqn during the Battle of Britain.

course were to be flown at approximately 800ft (245m) and turns at less than 200ft (60m) were forbidden. The course was specifically laid out to allow attempts on the 100km closed-circuit speed record of any category of aircraft participating, the speeds being homologated by official *Fédération Aéronautique Internationale* (FAI) time-keepers. Predictably, the morning of Saturday June 17 dawned with a ragged layer of low cloud; but, by the afternoon, when the race was due to start, the weather had improved and the first participants were away just after 1430hr. The handicapping of the various machines, with their wildly differing speeds, was arranged such that the slowest would take off first, with the quicker types taking off on cue from a carefully calibrated schedule worked out by the organisation's boffins.

With the first to leave having completed their second lap, Townsend, 34th in line to take off, was given the flag to depart, after which he immediately started overtaking the leaders, although he had two laps to make up in the course of their third. The last to leave were a pair of Spitfires — a two-seat Tr.8 and a Mk VB (with wartime Air Transport Auxiliary pilot Miss R.M. Sharpe flying the latter) — and with all aircraft aloft the crowd engaged in lively discussions about who the winner would be. The June 22, 1950, issue of *Flight*, described the final lap:

"Excitement was high as timekeepers made revised estimates of speeds and compared results with the latest reports from the turning-points. A

Royal victory was the prospect, but the 130 h.p. Cambridge-blue [Miles] Hawk Trainer [Edward Day's predicted "back-marker"] just succeeded in retaining a lead over the Hurricane that was tearing up behind at more than double its speed."

So, second place for the Royal Hurricane, although Townsend was commended for his airmanship by *Flight*'s reporter:

"Princess Margaret's Hurricane managed to improve considerably on its handicap time, and this was no doubt due in part to Gp Capt Townsend's excellent handling. Its 283 m.p.h. [455km/h] average at low altitude, and in quite rough air, was remarkable in spite of its cleanliness. The Merlin produced a healthy crackle from its round stub exhausts".

Interestingly it was also observed that a section of the Hurricane's port inboard leading edge was left in plain aluminium, in contrast to the aircraft's overall blue colour scheme — this was explained by the incorporation of a 9gal (41lit) integral oil tank to aid cooling.

MORE THROTTLE-BENDING

With the replacement of G-AMAU's Merlin 20 in early August with a Merlin 24, the aircraft was ready to participate in the Kemsley Trophy Race at Fairwood Common, near Swansea in Wales, over the weekend of August 19–20, 1950. With Neville Duke at the controls over three 27.66-mile (45km) laps of the seven-sided course superimposed over the picturesque Gower Peninsula,



ABOVE The team of Hawker test pilots that flew G-AMAU regularly in the 1950s, photographed at Dunsfold in the early 1960s. From top to bottom: Hugh Merewether; G.F. "Frank" Bullen; Sqn Ldr Frank Murphy; Sqn Ldr Neville Duke and A.W. "Bill" Bedford.

RIGHT Townsend makes a spine-cracking turn during the 1950 King's Cup race. The Hurricane and Townsend had been entered on behalf of Princess Margaret, who had to settle for second place when Townsend was beaten to the finish line by Edward Day's Miles Hawk.

the Hurricane, bearing Race No 41, passed the finishing line third at an average speed of 295 m.p.h. (475km/h), Duke having been unable to catch Fred Dunkerley's Miles Gemini, which took the Trophy.

The *Last of the Many*'s next major racing outing was September's *Daily Express Challenge Trophy*, organised by the Royal Aero Club to be held over a 201-mile (323km) course running from Hurn Airport in Hampshire eastwards along the South Coast, bending round to the north-east with the coastline before a sharp hairpin turn at Broadstairs in Kent to make a final dash westwards to the finish line at Herne Bay Pier.

Flying the Hurricane for this well-attended event (67 aircraft participated) was Hawker's Chief Production Test Pilot Sqn Ldr Frank Murphy DFC, who was given a handicap of more than an hour before he could join the race. On the day the weather was fair with broken cloud above 2,000ft (610m) over the whole course, a strong south-westerly wind boosting ground speeds but



also threatening bumpy conditions. On the stroke of 1400hr the starter's flag fell and the de Havilland Gipsy Moth of Mr R.A. Mann battled its way into the air. A stream of aircraft departed soon afterwards, the crosswind causing a number of the lighter machines to exchange positions during the group's protracted take-off. Some 67min after the departure of Mann's Gipsy Moth, Murphy and G-AMAU, bearing Race No 76, streaked away low over the trees with a trail of exhaust smoke; the race was well and truly on.

After much jostling for position among the somewhat disparate entrants (ranging from a diminutive Chilton D.W.1 to a civilianised Handley Page Halifax), the Percival Proctor flown by Mr N.W. Charlton crossed the finishing line first, the Hurricane coming in a rather disappointing 20 places later, despite having achieved the fastest actual speed (300 m.p.h — 483km/h) of all the competitors. The average time for the first ten winners was around the 1hr 45min mark; Murphy completed it in 40min 5sec.



ABOVE A regular sight at 1950s British airshows was Hawker's fleet of Sydney Camm-designed aircraft, which comprised, from nearest to furthest, Hart G-ABMR (currently on display at RAF Museum Hendon), Tomtit G-AFTA (still airworthy with the Shuttleworth Collection), Cygnet G-EBMB (now at RAF Museum Cosford) and G-AMAU.

With its first year as a racer and display aircraft behind it, *The Last of The Many* was maintained at Langley over the winter in preparation for its various commitments for 1951, the first of which was its appearance at the RAeS Garden Party at White Waltham on May 5. In charge of the Hurricane for this event was production test pilot Frank Bullen, who provided a more unusual display than perhaps even he was expecting. The May 11, 1951, issue of *Flight* reported that "Mr Bullen . . . put the last Hurricane through an uncompromising sequence of aerobatics — with the wheels down. His undercarriage light was literally 'on the blink', and he was unaware of the source of the extra drag until he had completed his rolls and loops".

Also reported a few pages later in the same issue was the news that HRH Princess Margaret had again entered the King's Cup Air Race, this time in four classes, her pilot unsurprisingly being Gp Capt Townsend. He was to fly Hawker's

Hart biplane, G-ABMR (which as a result was painted in a similar blue and gold scheme to that of G-AMAU) for the King's Cup and Kemsley Trophy races, and *The Last of The Many* in the Royal Aero Club's Jubilee Trophy and the Air League Cup contests, all of which were to be flown at Hatfield that June. The races were to be a prestigious part of the extensive programme of events put together to celebrate the ambitious Festival of Britain; but, in the event, typically dreadful British summer weather put paid to the exciting prospect and all four races were cancelled on the day.

FROM SPEED KING TO FILM STAR

On July 11, 1951, Hawker's Chief Inspector sent a letter to the ARB requesting that the Hurricane's C of A be reallocated with the addition of Normal Category subdivision (d) Private Use, as "in the course of their duties it is frequently necessary for our test pilots to make rapid liaison visits to

Peter Townsend taxis out in The Last of The Many, with race number "41" on the fin, at Wolverhampton, in June 1950. The Hurricane wore race number "76" for the Daily Express Challenge Trophy three months later.

JOHN HAVERS



One of the Hawker test pilots brings G-AMAU in close to company photographer Cyril Peckham's camera aircraft to show off the Hurricane's sleek lines, accentuated by its tasteful blue-and-gold colour scheme. The initial scheme incorporated a single gold cheatline extending from about quarter-chord of the wing to the aft tip of the rudder (broken only by the registration), with two angled cheat-lines (also in gold) being staggered above the main cheatline to the end of the cockpit rail.





ABOVE *Into uniform — in July 1951 G-AMAU was painted in camouflage for use in the Battle of Britain-themed film Angels One Five. The Hurricane made an appearance at the Daily Express 50 Years of Flying display at Hendon, where it is seen here with a spurious serial, P2619, and 56 Sqn code US-B, on July 21, 1951.*

Service units and/or other factories". The letter continues, "It is realised that the point of not issuing a Normal Category may be to prevent the aircraft falling into inexperienced hands. It is suggested this contingency could be overcome by an endorsement that the aircraft should only be flown by Hawker pilots or pilots duly authorised by the company's Chief Test Pilot". The ARB's response was short but not so sweet:

"The Board regrets to inform you that after due consideration it is unable to agree to this re-classification". The ARB had made a decision that ex-military types, which had not been built to contemporary civil airworthiness requirements, would no longer be granted Normal Cate-

gory status, and no exceptions could be made.

By the summer of 1951 work was gathering pace on the production of a film about the Battle of Britain, provisionally entitled *Hawks in the Sun*, based on the book *What Are Your Angels Now?* by Wg Cdr A.J.C. Pelham Groom, a sector controller at Biggin Hill during the battle. A number of Hurricanes would be required for filming and the production company, Templar Productions Ltd, began casting around for possible candidates in the late spring of 1951. Naturally Hawker was approached to release *The Last of the Many* for filming, and by mid-July Frank Murphy was writing to the Ministry of Civil Aviation to request permission to "fly this aircraft with markings not

Following the completion of Angels One Five, G-AMAU was painted in a new blue-and-gold scheme, with three gold bars extending to the rudder tip. Also, the name, The Last of The Many, was painted on the port side of the fuselage without a gold bar either side of the lettering, as there had been previously.



in accordance with the statutory requirements". Murphy's letter, dated July 13, 1951, explains that "due to the shortage of this type of aircraft, we have been requested to assist, and for the purposes of the film the aircraft will have the standard RAF camouflage scheme of green and earth, together with RAF roundels, fictitious squadron markings of US-B on each side of the fuselage and a fictitious serial, P2619, on the rear end of the fuselage.

"During the flying for the film, the aircraft will be flown by test pilots of this company. The Air Ministry are giving their full backing to this film, with personnel and aircraft and they will record the registration numbers referred to above in their register to ensure that the aircraft will bear identification markings which can be checked in the case of accident or infringement of flying regulations. The flying involved with the new markings will be between Langley and Kenley and over south-east England."

In company with several other Hurricanes (including five examples provided by the Portuguese Air Force, which used the type until mid-1954), G-AMAU was used, mainly in the hands of Hawker test pilot Bill Bedford, for the memorable flying sequences for the film, which was renamed *Angels One Five* for its release in March 1952.

Concurrent with the filming of *Angels One Five*,



G-AMAU put in an appearance during the *Daily Express* 50 Years of Flying Display, which was staged at RAF Hendon over the long weekend (including Monday) of July 19, 20 and 21. The July 27 issue of *The Aeroplane* noted that "the only aircraft present in the markings of the World War Two period was a solitary Hurricane. Its true identity as G-AMAU, *The Last of The Many*, was revealed by a few small details — painted gun ports, six exhaust stubs each side and a slight inaccuracy in the painting of the code letters. However, any Hurricane is better than none!"

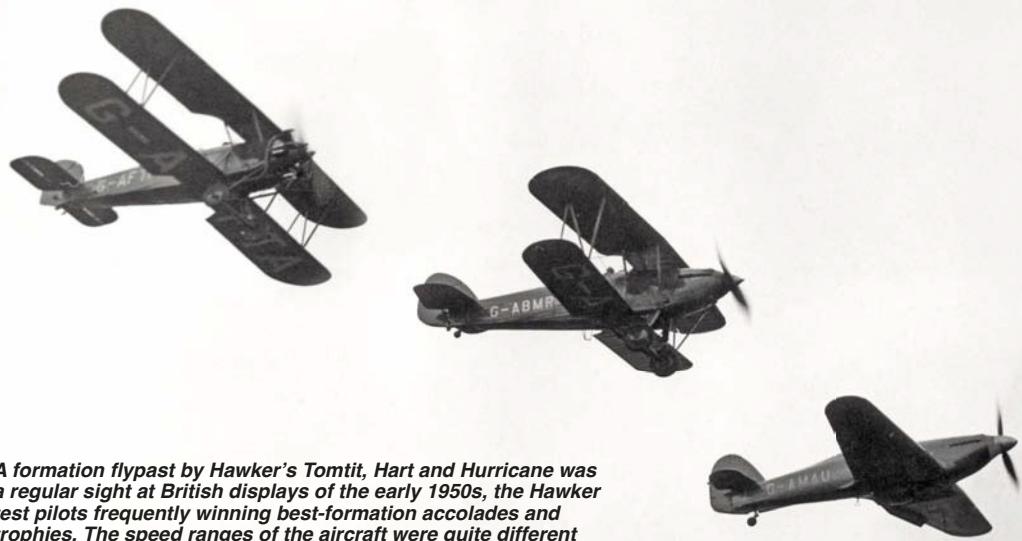
BACK INTO THE BLUE

With its filming commitments completed, *The Last of The Many* was put back into its signature royal-blue and gold markings, although the new colour scheme was a variation on the original, with three gold bars on the fuselage beginning just aft of the wing leading edge and running the length of the fuselage, broken only for the gold registration letters. The original scheme also had three gold bars starting at about the quarter-chord position, but the upper two of these tapered and stopped in line with the furthest aft position of the canopy rail, only one gold bar continuing to the rudder.

September 22, 1951, saw Murphy race the

TOP Colourful programmes for two of the air events of the summer of 1951. **BELOW** Frank Bullen at the controls of G-AMAU after its painting in the new post-*Angels One Five* colour scheme. *The Last of The Many*'s propeller was a Rotol RS 5/10 wooden variable-pitch three-blader of 11ft 3in diameter.





A formation flypast by Hawker's Tomtit, Hart and Hurricane was a regular sight at British displays of the early 1950s, the Hawker test pilots frequently winning best-formation accolades and trophies. The speed ranges of the aircraft were quite different and a generous helping of flap was necessary to keep the Hurricane in tight formation. This flyby was captured at White Waltham on August 31, 1952.

Hurricane again, this time for the *Daily Express* Challenge Trophy, in which he could muster only 28th place. Arguably the handicappers were favouring the less powerful entrants, as the first 15 to finish, led by Hugh Kendall in a Chilton D.W.1, were all light aircraft with low-powered engines, despite the participation of Murphy in the Hurricane and Jeffrey Quill in a Spitfire 22.

Business continued as usual throughout 1951 and 1952, with the Hurricane making regular appearances at airshows and aeronautical events in the hands of Hawker's team of test pilots, who no doubt enjoyed the display routines as much as did the general public. Bill Bedford planned to land at the Auster Flying Club for its annual air display

at Rearsby in Leicestershire on June 14, 1952, but had such trouble locating the airfield in the usual summer drizzle and 300ft overcast that he headed back south to refuel before giving it another go — and arrived in perfect time for his display.

The weather was thankfully much better for the Vintage Aeroplane Club's rally at White Waltham on August 31, which was attended by all four of Hawker's heritage fleet — the Cygnet, Tomtit, Hart and Hurricane — the last three of which won the formation flying competition with the help of a generous amount of flap and a large angle of attack on the part of the Hurricane.

The following year continued in the same vein, with the Hawker vintage fleet appearing at

This photograph, taken at Hatfield on June 23, 1951, during the (ultimately cancelled) National Air Races, clearly shows G-AMAU in the revised blue scheme, and there is evidence that it may have been painted in camouflage in early June, before being painted in the new scheme for this event, then repainted in camouflage to complete filming for Angels One Five — before being put back into the "new" scheme again!



PHILIP MOYES VIA MIKE STROUD COLLECTION

The Last of The Many at the National Air Races at Coventry in June 1954, at which it performed with the final example of the Fairey Swordfish, NF389, in a World War Two tribute. Although this photograph appears to show the Hurricane with a different-coloured rudder, it is in fact just a trick of the light shining on the high-gloss paint on the deflected rudder.



numerous shows and events. One of the more unusual tasks undertaken by G-AMAU in 1953 was as a communications machine during one of Neville Duke's successful World Air Speed Record attempts in Hunter WB188 in September of that year. Having set a new absolute speed record (727.6 m.p.h. — 1,170km/h) on September 7, Duke also captured the 100km closed-circuit race 13 days later at 709.2 m.p.h. (1,141km/h) over the same course from Dunsfold out to the South Coast and back again. As the Hunter passed over the waypoints of the course, the Hurricane followed in its wake to check that the modified Hunter had not infringed the markers, the homologators at the waypoints putting up white board patterns if it had done so. Happily, it did not infringe at any point and the record was confirmed.

The 1954 National Air Races at Coventry in June saw the freshly over-hauled Hurricane perform with the last of the not so many when, in company with Fairey Swordfish NF389 — the final example of the 2,391 built — it participated in a "Second World War Tableau" which also included Hawker's Hart, Gloster Gladiator G-AMRK, Spitfire V AB910 and a Lancaster with a mock-up of the bouncing bomb, then being used for the filming of *The Dam Busters*. In November the same year Duncan Simpson joined Hawker as a production test pilot and was added to the Hurricane display team, flying it at several events in 1955, including the Battle of Britain Week celebrations at Tangmere that September.

By the summer of 1956 *The Last of The Many* had become a regular sight at events and shows, a typical example being its display alongside — or more accurately against — Jeffrey Quill's Spitfire at that year's RAeS Garden Party at Wisley, Surrey, on July 15. The July 20 issue of *Flight* takes up the story:

"Scarcely had Quill succeeded in rectifying the handicap of a half-retracted starboard under-carriage when Hawker's blue-and-gold Hurricane, Bill Bedford [INSET LEFT] up, intruded upon the scene. The Hurricane's Merlin sang derision at the Spitfire's war-dance, and battle was instantly and closely joined. Many a doughty deed of fighter-pilotage was witnessed, the racking turns as the two pilots jockeyed for position having the stamp of grim earnest. We have Quill's assurance, indeed, that this memorable joust was quite unrehearsed." Imagine such a high-spirited *ad hoc* display being allowed today!



COUNTDOWN TO CAMOUFLAGE

The Hurricane continued to display at similar events over the next few seasons, the regular maintenance work undertaken on it keeping it remarkably free of snags. By January 1957 *The Last of The Many* and its vintage stablemates had moved base 30 miles south, from Langley to the Hawker factory at Dunsfold in Surrey. The Hurricane and Hart's C of A renewals were brought forward that year from June to March, G-AMAU having flown a total of 199hr 40min up to that time, without any notable technical



ABOVE G-AMAU at one of the many shows it visited during the 1950s. Although the Hurricane's civil scheme suited the type's elegant curves, a number of commentators in the press felt that it would be more appropriate to put the machine back into its original camouflage scheme. It was a wish that would ultimately come true.

problems. The first major mechanical snag in its seven years of display flying is noted on June 18, 1957, when Hawker's Chief Inspector at Blackpool sent a covering letter to his opposite number at Kingston stating the following:

"Herewith as promised are the points taken from the left-hand magneto of the Hurricane, which developed engine trouble at the show at Blackpool. We are endeavouring to obtain another set, which is proving difficult; should another set be available at Kingston we would be grateful if you would forward it as soon as possible."

The issue was presumably quickly resolved and *The Last of The Many* was returned to Dunsfold to resume its daily routine, although its appearances

seemed to be becoming less frequent. In an article auditing the preservation of historic Service aircraft in the January 4, 1957, issue of *Flight*, David Ogilvy commented that "Hurricane G-AMAU lives at Dunsfold and much too infrequently appears at displays in its Hawker house colours of dark blue and gold", suggesting that *The Last of The Many* was not as common a sight as it had been in previous seasons.

Continuing its dogfight double-act with Jeffrey Quill's Spitfire during 1957-58, G-AMAU, and specifically its civil colour scheme, roused the ire of *Flight* columnist "Roger Bacon" in his *Straight and Level* page in the July 4, 1958, issue:

"Few things delight me more than an old aero-

The pilot wrapped up tight against the cold, G-AMAU taxis past at RAF Stradishall in Suffolk in September 1959. At around this time the idea of putting The Last of The Many back into camouflage was mooted and approved by Hawker, making this one of the last photographs of it in its blue-and-gold scheme.

MIKE STROUD





ABOVE The Last of The Many in flight after its return to camouflage in 1960. This aircraft still flies today with the RAF's Battle of Britain Memorial Flight, and is currently painted in the markings of HW840, the Hurricane IIC of 34 Sqn flown by Canadian Flt Lt Jimmy Whalen, who was killed during the Battle for Kohima in April 1944.

plane well restored. The Gloster Gladiator, for example, gave me acute pleasure when I saw it at the recent RAeS Garden Party. Glosters have taken immense care to ensure the authenticity of its squadron markings. I still hope that Gloster's sister firm, Hawker, will do something about their Hurricane, *The Last of The Many*. It looks so wrong in blue and gold, and with a civil registration — especially alongside the 1940-camouflaged Spitfire which it dog-fought at the Garden Party."

Whether the head honchos at Hawker were swayed by *Flight*'s persuasive missives about G-AMAU's civil scheme or not may never be known, but within 16 months preparations were being put in hand to return the aircraft to its original camouflage. A letter dated November 4, 1959, from the company's Chief Production Draughtsman to the Chief Inspector, states that "the Specification for the camouflage paint scheme will be DTD 772. It is suggested that the civil registration letters be re-applied in White".

By January 1960 the plan to repaint *The Last of The Many* was more or less complete. In a letter dated January 5, 1960, test pilot Frank Bullen confirmed that "permission has been granted by the Ministry of Aviation for the Hurricane to be painted in camouflage showing its original serial number and bearing civil registration letters, in letters of 6in [15cm] depth, mounted beneath the tailplane. In addition the civil registration must appear on the owner's nameplate and the aircraft will be limited to flights within the UK only". Bullen also requested that the civil registration be applied in black letters, rather than the stipulated

white, the Chief Inspector replying that this "departure from the regulations" would depend on the mood of the ARB Surveyor. The latter was evidently in a good mood on the day of his decision as the registration letters were indeed applied discreetly in black in the shadows under the tailplane when the new scheme, to Drawing E.116520, was applied, written confirmation being signed off and put on file on March 18, 1960. The name *The Last of The Many* was retained, as it had been throughout its civil career, on the port side of the fuselage, this time in yellow letters.

Thus ended *The Last of The Many*'s days in its handsome gold-and-blue scheme, although as PZ865 the machine continued to visit shows and participate in thrilling dogfights with Jeffrey Quill's Spitfire, no doubt now enjoyed all the more by those who had campaigned to see it returned to uniform.

In 1972, having appeared in the 1969 *Battle of Britain* film, PZ865/G-AMAU was presented to the RAF's Battle of Britain Memorial Flight, with which it continues to fly nearly 70 years after its christening ceremony at Langley. This author's view is that the stylish, restrained blue-and-gold civil colour scheme worn by the aircraft throughout the 1950s was a welcome change of pace for a war-weary nation used to seeing aircraft as a means of destruction, and pointed to a new era of aeronautical endeavour in which records rather than buildings would be smashed. For one season perhaps, wouldn't it be refreshing to see *The Last of The Many* back in its elegant Royal scheme? I won't hold my breath . . .



RIGHT Captured at Grove in Denmark in 1945, this Arado Ar 234B was brought to the USA to become No 202, named Jane I. It was flown from Newark to the US Navy Flight Test Division at NAS Patuxent River, Maryland, but remained grounded owing to a lack of spares. It was struck off charge in December 1946 and dumped into the Patuxent in the early 1970s.

JOE PICARELLA COLLECTION



LEFT The sole Bell XFL-1 Airabonita was plagued by engine and undercarriage problems and was passed over in favour of the Vought F4U Corsair. PHILIP JARRETT COLLECTION

MAIN PICTURE An ignominious ending for the Airabonita, seen here inverted, and one of the Ar 234Bs, in a photo taken at Pax River at low tide in 1976.

CHRISTOPHER A. KOBERG

SUNKEN TREASURE?

While warbird collectors and aviation archaeologists go to increasingly challenging and expensive lengths to obtain rare aircraft and artefacts from remote spots worldwide, should we instead be looking for rarities much closer to home? **JOE PICARELLA** and **CHRISTOPHER A. KOBERG** uncover some forgotten treasures on America's doorstep



THESE DAYS the pages of mainstream aviation magazines are increasingly filled with heroic stories of badly-corroded airframe components that have been meticulously rebuilt into static restorations, or the fairytale-like return of aircraft back to flying status after decades of extinction. What an exciting time today's aviation historians find themselves living in, where like-minded people with conviction, skills — and, importantly, funding — can achieve seemingly impossible tasks. It was not that long ago when aircraft which would be considered super-rare today were being wantonly destroyed at an alarming rate, with little or no value attached to them, because they were judged beyond the realms of restoration either financially or practically.

Today things are very different. Vintage aircraft and even boxes of dusty components are prized because they fetch increasingly high prices within the historic aviation world. Even information pertaining to the location of vintage aircraft wrecks, particularly those of "warbirds", can demand a high price in the collectors' market.

While many of these "holy grail" wrecks are located out of reach on remote Pacific islands, frozen deep beneath compacted ice sheets in Greenland (such as Lockheed P-38F Lightning *Glacier Girl*) or, as David Cundall's ambitious Spitfire recovery team found out more recently, proving hard to find in politically difficult places like Burma, other equally valuable and indeed even rarer airframes may be found a little closer to civilisation than you might think ...

Ar 234B-2 WNr 140311, formerly of II/KG 76, was handed over to the RAF at Stavanger in Norway in May 1945. Becoming USA 40, then No 404, it was transported to the USA aboard HMS Reaper and delivered to Freeman Field, where it is seen here.



In the mid-1970s the staff at the USA's National Air and Space Museum (NASM), which was only a fraction of the size that it is today, began to hear stories pertaining to a pair of German wartime Arado Ar 234B jet bombers, and other rare American naval aircraft, which had been dumped on the riverbanks at Naval Air Station Patuxent River (or Pax River as it is commonly known) in Maryland, on Chesapeake Bay. Following confirmation that some "old airframes" did still exist at Pax River, permission to visit was obtained by the NASM's Associate Curator of Aeronautics, Robert C. Mikesh, in November 1974. He explains:

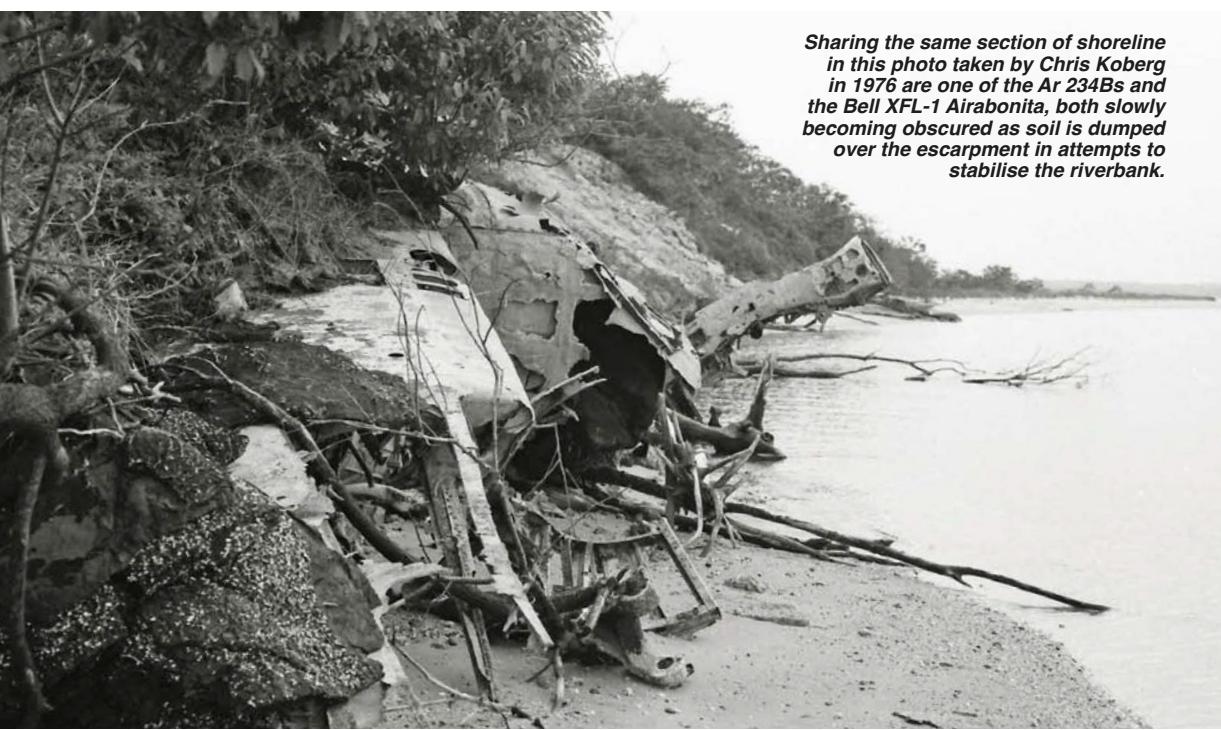
"I made the trip to Pax River merely to see for myself the condition of these aircraft, and as a

curator, either to do something constructive about them or to put to rest the idea of the museum doing anything at all."

Once at the site Mikesh noted that "I made my identification while standing atop the nacelle of one [Ar 234B], all of which was flush with the graded surface. The Bell XFL-1 Airabonita was in the water upside down, and at high tide all that showed was the wheel-less extended undercarriage. It did not appear that the Ar 234s had been buried very long".

Based on Bob's photos and his inspection, no further official interest was shown by the NASM, mainly because it had a complete Ar 234B (WNr 140312) within its collection already, and such battered wrecks were not seen as salvageable

Sharing the same section of shoreline in this photo taken by Chris Koberg in 1976 are one of the Ar 234Bs and the Bell XFL-1 Airabonita, both slowly becoming obscured as soil is dumped over the escarpment in attempts to stabilise the riverbank.



Before . . . in 1938 Bell offered a navalised version of the P-39 Airacobra, the XFL-1 Airabonita, in response to the US Navy's request for a light high-performance shipborne fighter. Broadly similar to the P-39, the XFL-1 featured a taildragger undercarriage, taller fin, arrester hook, strengthened airframe, larger wing and shorter fuselage . . .



PHILIP JARRETT COLLECTION

back then. It was difficult to ignore the aircraft, but as Bob says: "I knew of the tragedy of losing these aircraft to the world, and that was my reason for seeing for myself and putting all question aside".

ENTER CHRIS KOBERG

In 1976 Chris Koberg became involved in the story. He was in his senior year of high school and was doing volunteer work at the NASM's Silver Hill restoration and storage facility in Suitland, Maryland. He recalls: "I heard stories from museum staff about having been to the Naval Air Station in southern Maryland to inspect World War Two-era German aircraft which the US Navy had discarded and buried

around the air station, following their evaluation after the war".

The aircraft in question were both collected under the ægis of Col Harold E. Watson as part of Operation Lusty, in which the USAAF captured and evaluated German aircraft technology during and after World War Two, and which became known as "Watson's Whizzers". The Ar 234s were No 202, *Jane I*, given US Navy BuAer No 121445 and No 303, *Snafu I*, BuAer No 121446. Both were captured at Grove in Denmark and were transported, along with 39 other captured German aircraft, aboard *HMS Reaper* to Newark, New Jersey, whereupon the various aircraft were dispersed to Freeman Field in Indiana, Wright Field in Ohio and Pax

... and after. The Airabonita's remains in their final inverted resting place at Pax River. Note the relocation of the mainwheels to the leading edge of the wing. The tube at the nose end is the control column torque tube.



CHRISTOPHER A. KOBERG



ABOVE LEFT *The remains of one of the Ar 234's Junkers Jumo 004B axial-flow turbojet engines at Pax River in the spring of 1976. The photographs show that despite their rough treatment, the airframes were in relatively good condition.* ABOVE RIGHT *The empennage of one of the Ar 234s. The swastika on the fin has been "souvenired".*

River. Both Ar 234Bs were flown to Pax for testing, and allotted to the US Navy's Flight Test Division, but a lack of spares kept them on the ground until they were struck off charge on December 31, 1946.

Eventually such aircraft were simply dumped at locations around the air station and finally pushed off the bank and into the river. Out of view, they slowly became overgrown and forgotten, and soil was later pushed over them as the riverbanks eroded away.

LOST...

In the spring of 1976 Chris Koberg managed to make contact with someone at Pax River who was able to take him to see the German relics during low tide, when they were most accessible. He recalls how the airframe of the

XFL-1, the sole prototype of the navalised P-39, appeared and disappeared as storms lashed away at the shoreline. His Pax River contact explained to him that, owing to environmental pressures, the Navy was trying to find a museum that would be interested in recovering the aircraft. It was also pointed out that the tyres on the Arado closest to the beach still had air pressure in them and the hydraulic system still had accumulator pressure.

In addition to the riverbank wrecks, Chris's guide also described an area of woods overgrown with honeysuckle, where numerous aircraft engines had been dumped. Elsewhere on the base personnel had used metal-detectors to trace the outline of a buried Boeing B-17 that may have been the testbed fitted with a turboprop engine installation in the nose. A

CHRISTOPHER A. KOBERG x 3



ABOVE *One of the Ar 234s looking as though it is trying to claw its way back to the top of the riverbank. The jet bomber's back was broken as a result of having been pushed backwards off the escarpment. To view the exact location of the site, enter the following coordinates in the "Fly to" box in Google Earth: 38.304301, -76.41621.*



CHRISTOPHERA KOBERG x2

ABOVE In July 2013 Chris Koberg returned to the Pax River site to see what remained of the aircraft. Small pieces are still visible between the rocks and rubble.

complete Consolidated B-24 was also said to be buried on site, but a hangar had since been built over it.

Chris remembers how one of his high-school teachers subsequently recounted how "years earlier he had been stationed at Pax and remembered standing on the top of the fuselage of the Arado on the beach and being able to look inside the still-intact cockpit".

A couple of years after his initial treasure hunt, Chris moved away from the area and did not return until 1998. Still fascinated by the fate of these aircraft he returned to the site, by which time the Navy had stabilised the riverbank with additional soil, and the airframes were no longer visible. Chris recalls: "I was on a boat going along the shoreline where the Arados had been and there was nothing to be seen".

While this sad story of neglect seems to have occurred in slow motion over several decades, what is important to remember is that despite the fact that the Arados are no longer visible, these aircraft should still be where the Navy buried them, just a stone's throw from Washington DC.

...AND FOUND AGAIN?

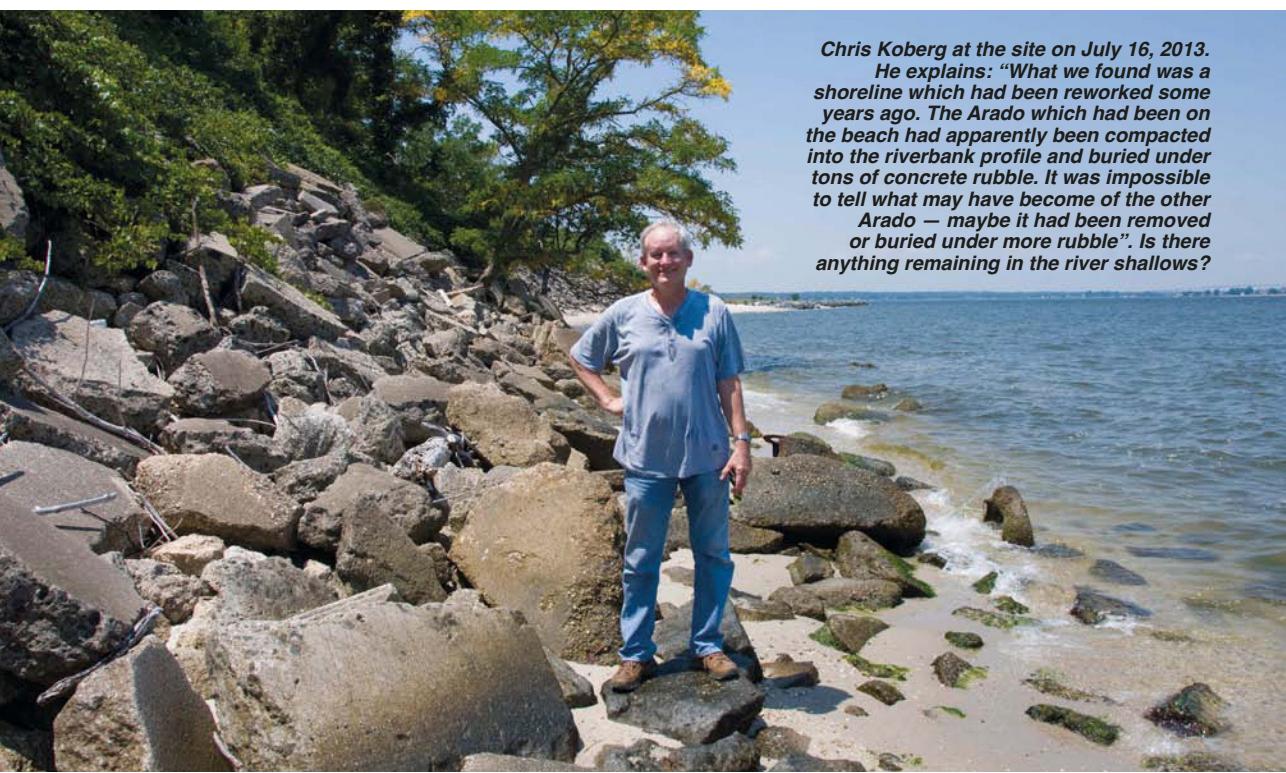
Over the last three decades, the value and rarity of such airframes, coupled with the strong upsurge of interest in such aircraft restorations and recoveries, and the ability to make such "basket cases" live again, means that the Pax River wrecks may still be viable restoration projects, and the fact that two Ar 234B airframes survive would further aid a potential restoration.

While the US Navy is well known for its "ownership" of former equipment, it would be interesting to ascertain if it would be willing to assist the aviation community in such a recovery programme, as these airframes are located on its own back porch, so to speak. Such a recovery could take many forms, from assisting a respected collector through to supporting a public recovery via a media company such as The Discovery Channel. The US Navy could even recover the airframes for its own museum. After all, the XFL-1 would be prize enough for Pensacola and the sale of a couple of secondhand Ar 234Bs might just fund such a recovery project. Will somebody step up to the plate and rescue this sunken treasure?

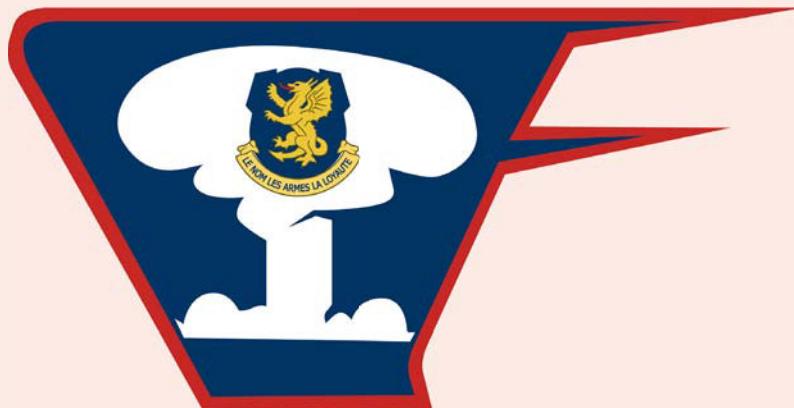


Chris Koberg at the site on July 16, 2013.

He explains: "What we found was a shoreline which had been reworked some years ago. The Arado which had been on the beach had apparently been compacted into the riverbank profile and buried under tons of concrete rubble. It was impossible to tell what may have become of the other Arado — maybe it had been removed or buried under more rubble". Is there anything remaining in the river shallows?



DAYS OF THUNDER



***The Republic F-84Fs of the USAF's 81st
Fighter Bomber Wing in Europe, 1954–58***



JOE WILLIAMS VIA AUTHOR

The first Republic F-84Fs for the 81st Fighter Bomber Wing, based at Bentwaters and Shepherds Grove, began arriving in October 1954. This Thunderstreak, 52-6449, was the mount of Lt Joe Williams of the 78th FBS, based at Shepherds Grove.



JOE WILLIAMS VIA AUTHOR

In the summer of 1954 the Sabre jockeys of the UK-based 81st Fighter Interceptor Wing were disappointed to learn that they were to be retrained as tactical bomber drivers — and, to their even greater dismay, given a new aircraft: the troublesome Republic F-84F Thunderstreak. **DOUG GORDON** traces the mixed fortunes of the 81st Fighter Bomber Wing's F-84Fs in Europe and **IAN BOTT** illustrates their potential role in a nuclear war

THE 81ST FIGHTER Interceptor Wing (FIW) had arrived in the UK in August 1951, equipped with the North American F-86A Sabre in the air defence role. Based at RAF stations Bentwaters and Shepherds Grove in Suffolk, the Wing, comprising the 78th, 91st and 92nd Fighter Interceptor Squadrons (FIS), had been responsible, with the RAF, for the air defence of the United Kingdom.

In August 1954 the 81st was redesignated as a Fighter Bomber Wing, and with this redesignation came a new role. The primary mission became "to destroy forces, resources and installations of the enemy". To accomplish this mission the 81st FBW was to fly the Republic F-84F Thunderstreak and deliver tactical atomic weapons.

Conversion began in October 1954, the first F-84 arriving by sea at Lisbon, Portugal, on October 4. Not all the pilots of the 81st were initially enamoured with the F-84F. Lieutenant Colonel Arlie Blood was CO of the 78th Fighter Bomber Squadron (FBS) based at Shepherds Grove:

"They took our beautiful F-86s away from us and equipped us with the F-84F fighter-bomber. The F-84s were shipped to Lisbon, to a Republic crew that installed the wings, and were then test hopped by a Republic test pilot. I flew down there and set up an 81st operation to 'buy' the airplanes after the test hop. I took off for England with our first F-84F. I was requested to do a flyby at Sculthorpe so all the generals could see this 'great' nuclear carrier. I did and they asked what I thought of the new fighter. I said, 'It's no F-86'."

TO NORTH AFRICA

Before the arrival of the F-84F and during transition, the 81st was obliged to accomplish much of its training for its new mission in the F-86. Indeed, the 78th FBS continued to receive F-86F-25s until October 1954. The unit deployed with F-86s to Nouasseur in Morocco during October and November 1954, specifically for practise in dive bombing and the Low Altitude Bombing System (LABS).



ABOVE Lieutenant Joe Williams (left) poses with his crew chief at Shepherds Grove beside his Thunderstreak. "I was not overly fond of the F-84F or its mission. Going from fighter-interceptor to special missions was a big change for us all. But when you wear the uniform, you must go with the change."

Nouasseur was chosen as the venue for the squadrons to make the transition to the F-84 as well as for training. Fair weather made for a high mission rate and efficient training. During 1954 a considerable number of pilots qualified on the F-84 at the Moroccan base. Sadly, these training operations took their toll on men and machines. Captain John T. Hale Jr of the 91st FBS and 1st Lt William Garney were both killed while transitioning in Morocco. Arlie Blood explains:



ABOVE Lieutenant Harry Eckes of the 91st Fighter Bomber Squadron (FBS) en route to Nouasseur, Morocco, in F-84F 52-6852. The flight to the North African base covered a distance of more than 1,200 miles (1,930km) and took about 2hr. Note the badge of the 81st FBW on the fuselage, and the individual squadron badge at the tip of the fin.

"We lost a very skilled pilot at gunnery camp in Africa during a dive-bomb run. Being used to the manoeuvrability of the F-86 he did not pull out of his dive in time and mushed into the ground".

Not all pilots found the Thunderstreak as objectionable as Lt Col Blood. Major Bob Fredette was with the 78th FBS and described the transition from the F-86 to the F-84 as "like converting from a sports car to a dump truck". He did warm to the type, however.

"Before flying the F-84F I flew the F-86A and -F [models]. [The Sabre and the Thunderstreak] had different missions and could not be compared objectively. You are talking apples and oranges. Our aircraft had wing spoilers and a slab tailplane. Its overall performance was very good, had a tremendous rate of turn, it was an honest aircraft. It had to overcome a bad reputation."

In March 1955 the 92nd FBS moved from Shepherds Grove to RAF Manston. In May of that year the last of the initial batch of F-84Fs arrived for the 81st FBW. All F-86As were returned to the USA, travelling by freighter from Belfast.

GOING NUCLEAR

The story of the service of the Thunderstreak with the 81st is characterised by both a catalogue of problems, modifications, replacements and frustrations on one hand and outstanding success in completing the assigned mission on the other. The many snags associated with the aircraft's development inevitably followed it into service, and were compounded by new ones from time to time.

The primary offensive weapon of the F-84F was the Mk 7 atomic bomb, weighing approximately 2,000lb (900kg) and yielding in excess of a kiloton.

For the carriage of this weapon the aircraft was fitted with a specially designed pylon to be carried under the port wing.

Special Weapons training, exercises and security occupied much of the Wing's time and energies. Training was hard and highly intensive. The bomb commanders, as the pilots were known, were used to much of the ethos that prevailed in an atomic strike unit, but it was a new experience for many of the pilots of the 81st, some of whom were new to the Wing as well as the mission. With the change in role of the Wing many of the experienced personnel had returned home, to be replaced by young pilots fresh from college.

Every bomb commander was obliged to attain a grade of at least 90 per cent every 90 days on knowledge of the weapon and the ramifications of its use. They would be monitored on a mock-up trainer and in flight; weapons loading and pre- and post-flight procedures were included.

Initial deliveries were of the F-84F-35 and F-84F-40 series, powered by the unmodified Wright J65 engine (a development of the British Armstrong Siddeley Sapphire), which brought its own problems. The new aircraft, despite being fitted with the Minneapolis Honeywell-Regulator Company's MA-1 bombing computer, was unsuited to LABS manoeuvres. This was the same system that had been used in the Thunderstreak's predecessor, the F-84G Thunderjet, and was not entirely satisfactory. For this reason an alternative method of special weapons delivery (SWD) was devised. Lieutenant Joe Williams explains:

"We used the 13,000ft [3,960m] release in a high-altitude dive-bomb run. We would go into the dive at 24,000ft [7,315m] and release at 13,000ft.



ABOVE Four 91st FBS pilots; from left to right: Lt Bob Stone; Lt Sterling Lee; Lt Bob Russ and Capt Dick Schoenemann. Stone was later shot down in Vietnam, Lee was killed after ejecting from an F-101; Russ and Schoenemann became high-ranking USAF Generals.

LEFT Lieutenant Don Mikler and F-84F at Nouasseur in December 1955. The USAF in Europe (USAFE) used Nouasseur in Morocco and Wheelus in Libya for fair-weather weapons practice for all of its units.

One time during practice dive-bombing at the Dengie Flats [in Essex] in England, I forgot to pull the power off after climbing back up to the perch. On the next dive, after bomb release, the airspeed was 700kt [805 m.p.h — 1,300km/h]. Thank God for the 13,000ft release. For bombing practice we had a small rotating rack that held eight small 'Blue Boys' that were supposed to simulate the real thing, with a shotgun charge that went off when the bomb hit the ground to show where it hit in relation to the target, and this was used to score the hits. When we flew with the big bomb shape, the aircraft had a tendency to roll as your speed built up in the dive run. But this was easily countered with aileron. We had one fellow in our squadron that went in at the Dengie Flats range, flew the airplane right into the ground. You have very poor depth perception over water so it is best to watch your altimeter."

Later Block 45 and 50 F-84Fs had a spoiler to im-

prove low-altitude bombing capability, as well as the MA-2 LABS computer, which was to become standard during most of the type's service life.

When LABS became the standard method of SWD, it was practised mainly at Nouasseur. Lieutenant Gil Leimbach recalls:

"The 78th FBS went to Nouasseur to do LABS manœuvres on a Strategic Air Command [SAC] bomber range. LABS was an all-weather manœuvre. The aircraft would arrive over the target at 500ft [150m] at very high speed and pull up into a 4g loop manœuvre. If it was cloudy, this would be on instruments. [The pilot would then] roll out at the top using the artificial horizon. The practice bomb would automatically release, go straight up, lose velocity and go straight down. This time allows the aircraft clearance to survive a nuclear explosion safely. Needless to say [it was] much better than high-altitude bombing."

The change in the primary mission and aircraft

This F-84F-45-RE, 52-6737, is seen in the distinctive yellow markings of the 92nd FBS, which was based at RAF Manston from March 1955 until the end of April 1958, at which time it joined the rest of the 81st FBW at RAF Bentwaters. MIKE HOOKS





Thunderstreaks of the Bentwaters-based 91st FBS peel off for a series of publicity photographs in 1956. Republic was keen to extol the type's virtues, the accompanying press release claiming that the F-84 "adds speed and atomic punch to the free world's air arsenal".

TAH ARCHIVE

of the 81st FBW necessitated a change in the role the Wing was called upon to play in the many exercises in which it took part.

GETTING PLENTY OF EXERCISE

Exercise *Carte Blanche*, one of the first significant ones in Cold War Europe, was undertaken on June 21–28, 1955. It encompassed all Nato countries and various tactical units and their aircraft. The scenario was the outbreak of an atomic war, and the exercise was designed to test all current plans in dispersal, tactical control and alert responses.

The 81st FBW was responsible for making simulated atomic bomb strikes on mainland Europe from dispersal points in the UK. The 91st FBS, part of the 81st, operated from Bentwaters in Suffolk and dispersed some aircraft to Manston in Kent. The exercise was a marked success and, certainly for the F-84F bomb commanders, it was a fitting reward for months of intensive training. The 91st FBS launched 26 strikes on targets in Europe and all were successful.

Leimbach was with the 78th FBS at Shepherds

Grove; he flew to targets in France. He remembers:

"I took off from Shepherds Grove and headed for a French aerodrome in the Lyons area. The weather was VFR [visual flight rules], a beautiful day. Low level all the way, 500ft [150m]. I contacted the airfield tower that I was coming. They acknowledged and I made a LABS manœuvre and headed back to the Grove. As far as I can remember all of my 'real war' targets were airfields in East Germany."

Exercise *Beware* in September 1955 dispersed squadrons of the 81st FBW to bases in Europe to launch strikes against the UK in a test of the latter's air defences. The F-84Fs were more than a match for the Gloster Meteors and de Havilland Venoms of RAF Fighter Command. The 92nd FBS was proud of its success in striking unhindered from its base in West Germany.

Success in penetration exercises such as *Carte Blanche*, *Beware* and *Fox Paw*, the latter taking place in November 1955, was achieved despite training facilities for the Thunderstreak Wings being far from adequate. One of the principal problems

Wearing both the 81st FBW's badge on the fuselage and the lizard badge of the 78th FBS (nicknamed the "Bushmasters") on the fin, Thunderstreak 52-6749 was photographed at Bentwaters Armed Forces Day in 1958. The sunburst markings on the fin and the panel on the nose were dark red.

ROBBIE ROBINSON VIA AUTHOR



Over-the-shoulder toss-bombing: stunting to survive

1 The pilot approaches the target at low level – 200-300ft (60-90m) and high speed – 500 m.p.h. (805km/h)

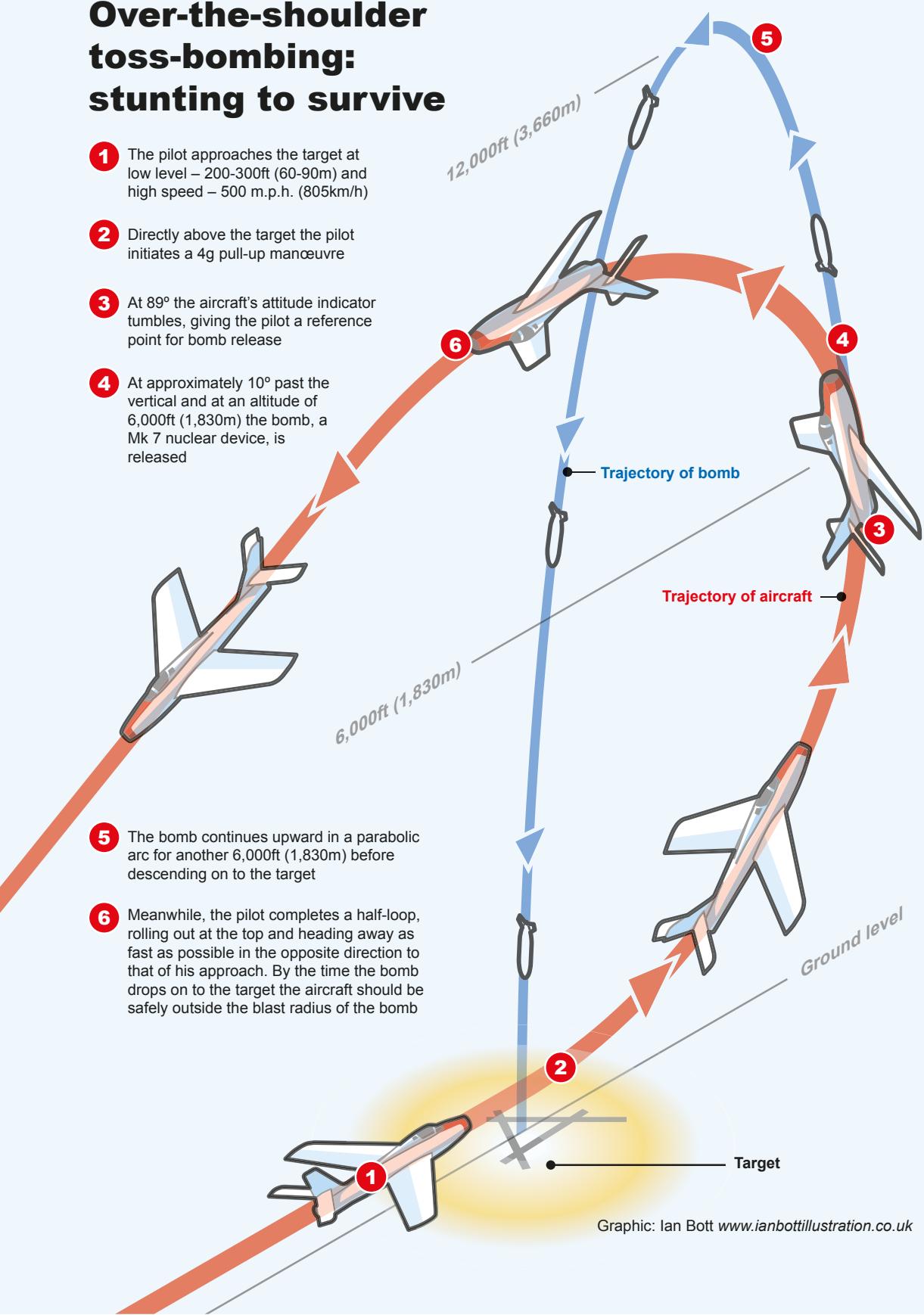
2 Directly above the target the pilot initiates a 4g pull-up manœuvre

3 At 89° the aircraft's attitude indicator tumbles, giving the pilot a reference point for bomb release

4 At approximately 10° past the vertical and at an altitude of 6,000ft (1,830m) the bomb, a Mk 7 nuclear device, is released

5 The bomb continues upward in a parabolic arc for another 6,000ft (1,830m) before descending on to the target

6 Meanwhile, the pilot completes a half-loop, rolling out at the top and heading away as fast as possible in the opposite direction to that of his approach. By the time the bomb drops on to the target the aircraft should be safely outside the blast radius of the bomb



was the lack of suitable range facilities. In England the only option for bomb delivery was Dengie Flats. Effective use of this range was dependent on the weather, which put it out of use for several months in every year.

Operation *Long Stride* took the squadrons to North Africa for fair-weather training. Without such exercises there would have been little chance of the bomb commanders being proficient enough to do the job should "D-Day" ever happen.

In Exercise *Brown Cow* the 91st FBS bomb commanders' navigation skills were tested as well as their abilities in SWD. One 500lb (225kg) bomb was dropped by each of the bomb commanders on Dengie Flats. The delivery method was by high-angle dive-bombing. The 91st had only three F-84F-45 series aircraft at this time and only the pilots of these were allowed to use the "over-the-shoulder" LABS delivery technique, which achieved good results.

That the Thunderstreak was not very popular is probably due to the many problems associated with its development and early service career. It is a tribute to the pilots who flew it and the groundcrews who maintained it that they overcame many of the drawbacks and achieved a high degree of success in these exercises.

SIMPLY THE BEST

In July 1956 the 81st FBW flew down to Wheelus in Libya for an SWD meeting. Pilots from each of the squadrons represented their Wing in a competition to determine the best SWD unit in USAFE

(USAF Europe). The meeting did include other aspects of the mission assigned, but the atomic weapons delivery part was the most significant for the 81st. Pilots were selected for their skill and precision.

Other USAFE units at the meeting were flying different types, such as the F-86F Sabre. The fact that the 81st FBW and the 20th FBW, based at Wethersfield in Essex, were flying the F-84F made the competition keener, making the operators of both types all the more determined that their aircraft should prevail. The reputation of the F-84F had undoubtedly gone before it and this made victory or, at the very least, a respectable showing, imperative. Bob Fredette of the 78th FBS explains:

"I have always been proud that the 81st won the USAFE bombing meet and, specifically, the 78th FBS, of which I was the CO at the time. The team representing the Wing was composed of weapons-loading crews and a total of six pilots; two each from the 78th, 91st and 92nd. The materiel officer, Capt Barrantine, and the Fly Away Kit Section [parts and supplies] were all from the 78th.

"The meet was won by two 78th pilots — Captains Dee McCarter and Raymond Kingston. We became the USAFE Special Weapons Delivery Champions. They ran away with it! As a result, in October 1956 this team proceeded to Nellis AFB [Nevada, USA] for the USAF Bombing Meet.

"The team departed England, the pilots flying our aircraft to Nellis via Iceland and Goose Bay,

The Thunderstreaks of the 81st FBW were regular visitors to British airshows in the 1950s, 52-6718 of the 78th FBS being seen here alongside Boeing KB-29P 0-469716 of the 420th Air Refuelling Squadron — the 0-designation was added to operational USAF aircraft serials (in this case 44-69716) to indicate they were more than ten years old.

TAH ARCHIVE





DON MIKLER VIA AUTHOR

ABOVE "C" Flight of the 91st FBS flies a four-aircraft formation for a publicity shoot. Captain Jack Bowman leads the quartet, accompanied by Lieutenants Don Hanto, Jim Wilson and Harry Eckes. The blue lightning flashes on the fin were just one example of the variety of markings carried by the 91st FBS during the Thunderstreak period.

Labrador. The maintenance team flew in a [Douglas] C-54 to Nellis. The entire team beat the favourites from the SAC team, and was totally independent. They did not rely on any other support except for fuel. Again, Kingston and McCarter won the meet on the final day by simply devastating the other teams on scoring. Upon return to England, the aircraft were painted with 'USAF CHAMPS' on the fuselage. As far as the meet was concerned, even in publicity terms, SAC was supposed to be the 'shoe-in'. Our team waxed them. Kingston celebrated by stopping in Las Vegas and was showered with affection by Miss Candy Barr, Las Vegas Entertainer."

It was fitting that the Thunderstreak was thrust into the limelight at such a time — it had been established at both competitions that here was an aircraft that could do the job for which it had been designed despite the numerous problems that had bedevilled it. By way of underlining

this, the 81st FBW was awarded the USAFE Tactical Proficiency Trophy for the first half of 1956. The Operational Readiness Inspection (ORT) team had considered the Wing the best it had ever inspected.

RISING TENSIONS

The first-ever visit of the Soviet Union's Bolshoi Ballet to the UK in October 1956 should have been an occasion for cultural celebration, but, coming as it did at a time of crisis, a considerable amount of consternation and confusion was evident in military circles on the day of arrival, not least at RAF Manston where the 92nd FBS resided alongside the 406th FIW. No warning had been given of the imminent arrival of a Tupolev Tu-104 of Aeroflot which had diverted from Heathrow owing to fog. Hurried arrangements were made to cover up the sensitive special-weapon practice stores slung under the wings of the 92nd's F-84Fs.

That year also witnessed two major international events which underlined the necessity of maintaining a high degree of readiness in all Nato tactical strike units. The Suez Crisis of October—November 1956 saw no direct involvement from the USA. The USAF nevertheless placed its bases on high alert and was ready to react if any Soviet moves were made against its allies, Britain and France. Security of the bases was tightened considerably for the duration of the crisis. A 24hr alert condition was imposed, with weapons loaded and bomb commanders on standby. The plutonium cores of the special weapons were beside the aircraft in their cages, next to which was a guard and his German Shepherd dog.

Soviet aggression in Hungary, also in October and November, kept the tension, and thus the readiness of the F-84F strike units, at a high level. Wing Intelligence kept a watching brief on





VIA AUTHOR

ABOVE The Thunderstreaks of the 81st FBW were occasionally fitted with jet-assisted take-off (JATO) rocket bottles to improve the type's take-off performance when heavily laden. In this photo of 78th FBS Thunderstreak 52-6780 the aft ends of the JATO bottles may just be seen behind the tail-end of the wing-mounted fuel tank.

developments and a round-the-clock review of targets, charts and maps.

Tension eased towards the end of 1956, by which time the F-84F was receiving further modifications, including a selector switch to use with the MA-1 LABS computer. This enabled the pilot to select either a conventional or "over-the-shoulder" delivery. This was also used with the MA-2 system newly installed in some aircraft.

Although the F-84F had been in service for less than two years and was at the height of its mission success, moves were already afoot to replace it in the 81st. The aircraft to do this was the North American F-100 Super Sabre. Examples of this state-of-the-art fighter-bomber were already in service with USAFE with the 36th Fighter Day Wing and the 48th Fighter Bomber Wing, based in Germany and France respectively. The 81st FBW published its F-100D Conversion Plan 5-56 and was in regular contact with the 45th Fighter Day Squadron (FDS) based at Sidi Slimane in French Morocco. The 45th FDS was flying the F-100C and was tasked with converting USAFE pilots to the type. In the event, the 81st's conversion plan was unrealistically optimistic. The unit was destined never to fly the aircraft.

MORE EXERCISES — MORE FRUSTRATION

As the proficiency of the bomb commanders in SWD techniques increased, so did frustration with the F-84F and the nature of the exercises being undertaken. There was too great a restriction on low flying in the UK; 2,000ft (610m) was just too high for an authentic mission to be flown. Exercise *Vigilante*, undertaken in October 1956 against UK targets, led to an appeal from the pilots to be allowed to drop their fuel tanks on approach to the target just as they would in wartime.

The 81st pilots found that there was a dramatic increase in their target folders when the unit was

forced to incorporate those assigned to other USAF units, while the latter converted to the F-100D. The 92nd FBS alone doubled its targets, many of which had been designed for the F-100D. The efficient attacking of these targets required the Super Sabre's advanced performance. The F-84Fs could reach the targets, but were limited by the necessity of being flown at optimum rather than maximum performance. In wartime this would mean an increase in the number of aircraft intercepted by the enemy. As 1957 progressed these frustrations became more profound. Exercise *Fog Cut*, undertaken in the latter part of the year, in which the 81st attacked targets in the UK, saw a number of F-84F intercepts — most of which, the pilots maintained, could have been avoided but for the restrictions placed upon the type.

The F-84F was, in any event, proving problematic in meeting the requirements of the ever-increasing developments in SWD. Several aircraft were destroyed while performing LABS delivery. Two aircraft hit the ground when they failed to recover from the manoeuvre. The 91st FBS instituted an indoctrination programme on Instrument Flight Conditions (IFC) recovery from LABS manoeuvres. There was a lack of confidence in the altitude gyro. It was made mandatory that each mission contemplating IFC LABS recoveries must first obtain permission of the commander or operations officer. There were other accidents. The undercarriage of Thunderstreak 52-6707 extended during a bombing run. Another aircraft aborted a take-off, crashed and caught fire, resulting in a pilot fatality; another crashed on approach owing to a hydraulic failure, also killing the pilot. A common accident was the loss of the drag 'chute in flight owing to excessive vibration causing the holding bolts to loosen. In November 1957 bomb commanders of the 92nd FBS attended



DON MIKLER VIA AUTHOR

ABOVE Lieutenant Don Mikler heads out for the range on one of the 81st's many practice missions, in which the Wing's Thunderstreaks would rehearse the prescribed techniques for toss-bombing and the Low-Altitude Bombing System (LABS), either of which could be used to deliver a nuclear weapon should the need arise.

an F-100D training course at RAF Wethersfield.

The dawning of 1958 saw a dramatic development. Moves were being made in the Pentagon to convert the 81st FBW, not to the F-100D as everyone had supposed, but to a type of which there was only one Wing operating in the entire USAF — the McDonnell F-101 Voodoo. Not only was the Voodoo at the end of its production run, but it had been designed as an escort fighter for SAC bombers, not as a tactical atomic strike aircraft. Having just one Wing of a particular aircraft type in the European theatre would seemingly pose considerable logistical problems. However, despite the protestations and indisputable logistical reasons not to convert to the F-101 put forward by the Commander of USAFE, General Frank Everest, the conversion was to go ahead at the end of 1958. The 27th TFW was to move its entire inventory of Voodoos, pilots and ground support to re-equip the 81st.

Before the arrival of the new aircraft there were other developments for the 81st. On May 8, 1958,

the 92nd FBS moved to Bentwaters, heralding the unit's arrival with a 28-aircraft flypast. On July 8, 1958, the 81st was passed control of RAF Woodbridge in Suffolk from the 20th FBW. The previous day the 81st had been redesignated as the 81st Tactical Fighter Wing.

By way of an introduction to the Voodoo, on July 28, 1958, Maj John "J.J." Burns led four F-101Cs of the 522nd Tactical Fighter Squadron (TFS) to Europe, calling at Liège in Belgium, Bentwaters, Soesterberg in The Netherlands and Nouasseur in Morocco.

Special weapons training remained relentless. Regular *Cold Wind* exercises were introduced to test the Wing's capabilities at performing atomic strikes. Missions were planned to hit friendly targets the same distance from base as those of the potential enemy. Detachments to North Africa continued. Lieutenant Charles Taylor was sent to Iran to train Iranian pilots on the Thunderstreak. First Lieutenants Thomas Adams and Paul Baker were detached to Pakistan as members of a special

In July 1958 the 81st FBW was redesignated the 81st Tactical Fighter Wing in preparation for deliveries of its new mount, the McDonnell F-101 Voodoo. This example, 56-0027 of the 81st TFW, was one of those that started replacing the F-84Fs in late 1958.

ALAN JOHNSON VIA AUTHOR





"aggressor" squadron for Pakistan Air Force exercises. The 78th FBS detached eight aircraft, accompanied by a Lockheed C-130, to Sola-Stavanger in Norway for Exercise *Full Play* in July 1958. In December the newly-redesignated 78th TFS moved in to Woodbridge.

THUNDERSTREAK TO VOODOO

In July 1958 the F-101 Mobile Training Detachment was established at Bentwaters, a simulator arriving from Bergstrom AFB, near Austin, Texas, home of the the 27th Tactical Fighter Wing (TFW), at the same time. Pilots of the 81st TFW were detached regularly to the Texas base for training on the Voodoo during 1958. By December some 40 pilots had returned to the UK and the 81st had 48 F-101s on strength, as well as 25 F-84Fs. As the new aircraft arrived, so the Thunderstreaks were sent to Leeuwarden in Holland for subsequent use by the West German Air Force. The first to go were 52-6824 and 52-6792. Throughout the year more and more filtered away.

It required considerable skill and dedication for the squadrons to remain combat-ready with the F-84F while simultaneously getting to grips with a new type. In July 1958 Operation *Blast Off* required a number of aircraft and crews to be maintained on alert around the clock, ready to take off at a moment's notice to strike key targets. During the 1958 Middle East crisis, centred on Lebanon (see *Keeping the Peace, TA4*), the number of crews on *Blast Off* was increased.

It was during the latter part of 1958, when conversion to the Voodoo was well under way, that an F-84F of the 92nd TFS "inadvertently" violated East Germany's air defence zone. This navigational error resulted in an order going out from 81st headquarters that no aircraft must proceed across the West German border without first receiving positive radar identification. This ruling was rescinded at the end of the year as it proved a handicap to realism in operational flying training because of the necessity of turning round at the border.

By the end of 1958 all F-84Fs of the 81st TFW had departed for service with the air arms of Nato allies or the Air National Guard back home in the USA. The Thunderstreak had served for a comparatively short three years as a front-line fighter-bomber. Today, at a time when we measure the service life of combat aircraft in decades rather than years, it is easy to view the F-84F as a failure. It had a difficult gestation and initially an equally difficult Service career. It is highly probable that the pilots of the 81st TFW did not miss it one bit. Nevertheless, the memories of its successes, at Wheelus and Nellis in particular, have provided it with some degree of respectability as a competent strike aircraft.

HEATH ROBINSON,

ONE OF THE "innovations" at both RAF Bentwaters and Shepherds Grove was the installation of an arresting barrier. The F-84F, often referred to as the "Super Hog", took up a lot of runway normally — but, in the event of an emergency occurring during landing, the type was guaranteed to run off the runway. In order to save lives and aeroplanes, arresting barriers were installed. Both were less than successful initially. On March 16, 1955, Gil Leimbach's F-84 suffered hydraulic failure at Shepherds Grove. He remembers:

"On my second check flight I had hydraulic failure after take-off. I couldn't get my undercarriage up. I decided that I would stay in the pattern and shoot GCAs [ground-controlled approaches] until my fuel got burned down. As soon as I turned downwind, however, I had fluctuation in my controls and decided to land ASAP. We had a brand-new contraption called an arresting barrier. This consisted of anchor chains from a destroyer, which were hooked to a barrier that looked like a tennis-court net strung across the very end of the runway. The idea was to engage the webbing. This raised the 1in [2.5cm]-thick cable which flipped up and engaged the main undercarriage struts. Just before touching down I stopcocked the engine. I found that for a while I was the world's fastest tricycle. I hit the barrier in the middle as advertised but the cable hit the area 4ft [1.2m] in front of my undercarriage and bounced down. It did partly connect with my starboard strut and I thought I was going to flip over, at 100 m.p.h. [160km/h]. The aircraft found the ditch at the end and came to a halt. A rough ride but no bruises."

Gil's experience was published in the local *Bury Free Press* under the headline *Heath-Robinson Rope Trick Saved Pilot's Life*. It was evident that the barrier had malfunctioned, though, so steps were taken to find and rectify the problems. The 91st's Lt Don Mikler recalls:

"We had had a few 'Hogs' with control problems going right through the barrier because it did not work properly. One day a second lieutenant from the civil engineering squadron [William H. Fleming] was waiting to cross the runway in his car. A red light held him for a while. He got bored and didn't wait for the green light and crossed the runway. Word got back to Colonel Ivan McElroy, the wing commander, and he invited the lieutenant to his office, and assigned him the onerous task of correcting the malfunctioning barrier.

"The lieutenant was a nice guy; we were drinking buddies. He rounded up an undercarriage off a wrecked Hog and attached it to a steel frame, so it was the same shape as a Hog. He then rigged it on the front of a Six-By truck. He put pierced-steel planking [PSP] in the truck bed for more weight. The truck performed poorly and he couldn't get it up to more than 60 m.p.h. [95 km/h] or so.

"I suggested he put some JATO [jet-assisted take-off] bottles on the Six-By. We also decided a few retro-bottles on the front might be appropriate. He got it all done as suggested. Nobody knew about it except a few of us second lieutenants. So he got it ready and one day drove out to the end of the runway. He had a jet helmet on and a flying suit. The convertible-like canvas top was down and the windshield was folded down and he was out in the breeze. He had installed a pitot tube on the rig and had an airspeed indicator on the hood in front of the steering wheel. It looked completely ridiculous. Somehow about 500 spectators had gathered around



SUPER HOGS & “THE THING”...

the field to observe a test of the truck and barrier. He had cameras set up and the whole shooting match was recorded on film. So at the appropriate time he took to the runway and headed for the barrier as fast as that Six-By would go; he then fired the JATO bottles and proceeded rapidly down the runway and through the barrier, at about 90–100kt. The barrier failed to engage the rig so he had to fire the retros and finally came to a stop in the over-run in a huge cloud of JATO smoke, with the crowd doubled over in laughter and applause.”

Although this first firing of “*The Thing*”, as it had been christened, was not a total success, three subsequent tests did ascertain where the problems lay. In the third test the lifter straps were raised by 39in (99cm). *The Thing* entered the barrier at about 85 m.p.h. (137km/h)

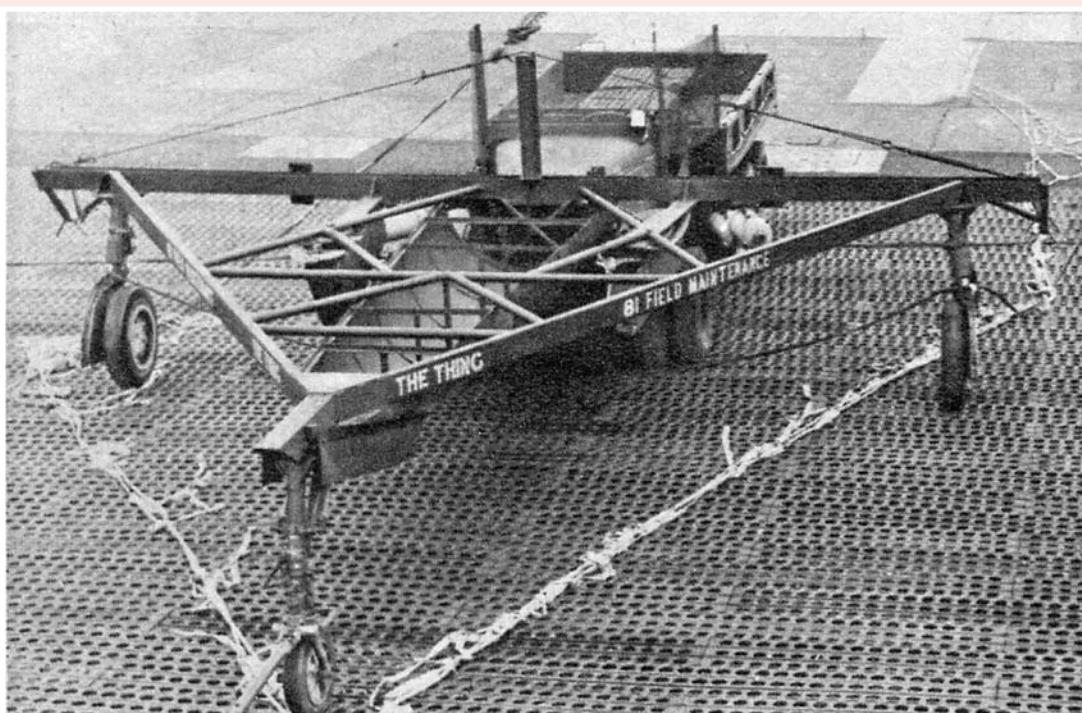
and was stopped in approximately 140yd (128m) without the use of the retro-rockets. In the final test *The Thing* was loaded to 20,000lb (9,000kg) to simulate an F-84F with two 230 US gal (870lit) droptanks. It entered the barrier at 105 m.p.h. (169km/h) and was successfully brought to rest in 200yd (182m).

The final proof came when the pilot of F-84F 57-6716 called an emergency on approach to Bentwaters as he was low on fuel. He asked for the barrier to be deployed. The Hog, with a landing weight of 18,000lb (8,165kg), entered the barrier at a speed of 161 m.p.h. (260 km/h). The aircraft came to a stop 600ft (190m) down the runway. There was no fire and no injury. Subsequently there were several successful barrier engagements which saved lives and valuable aircraft.



GILLEMBACH VIA AUTHOR

USAF VIA AUTHOR



TOP The problem — Gil Leimbach's F-84F after having sailed through the arresting barrier at Shepherds Grove in March 1955. The barriers at Bentwaters and “The Grove” both proved inadequate, a situation that led to . . . ABOVE . . . “The Thing” — a Six-By truck fitted with a steel frame and an F-84F undercarriage to simulate the type's track. Six jet-assisted take-off (JATO) bottles were fitted to the contraption to give it the required grunt.



GONE FISHIN'!



Is it a boat? Is it a helicopter? When former Kaman Aircraft designer Igor Bensen set up his own company in 1953, he was determined to pursue the "less is more" ethos to its logical conclusion — and developed some decidedly oddball rotorcraft in the process

IF YOU REALLY want to fly and haven't much money, you must first make up your mind to leave the little girlfriend on the ground." Thus Frenchman Henri Mignet put forward the design philosophy behind his popular — if not entirely successful — series of "Flying Flea" do-it-yourself light aircraft of the 1930s. For those seeking an ultra-lightweight, highly affordable means of flying, the holy grail was the most minimal single-seater possible — and it didn't get any more minimal than the series of ingenious rotary-wing aircraft devised by Igor Bensen (**TOP RIGHT**) in the USA in the 1950s.

In 1953 the Russian emigré and former Kaman Aircraft Chief of Research established the Bensen Aircraft Corporation in Raleigh, North Carolina, and soon developed a number of novel machines, the company's first major success being the B-8 Gyro-Glider of 1955. A simple unpowered rotor-

kite that was towed behind a car and released, the B-8 could be supplied as a complete aircraft or as a kit of parts and plans for amateur builders. Importantly, at that time, no pilot's licence was required to fly it, and it sold well.

In 1957 the motorised B-8M Gyro-Copter was introduced, the addition of a 72 h.p. McCulloch 4318E four-cylinder air-cooled two-stroke engine enabling the skeletal machine to operate under its own power at speeds of up to 50 m.p.h (80km/h). Exchanging the wheels for floats resulted in the B-8MW Hydro-Copter — perfect for those hard-to-reach fishing spots hitherto considered safe by the most prized lake and river inhabitants.

Although a comparatively little-known name in aviation's wider circles, Igor Bensen was a true pioneer in the homebuilt aircraft community — he even built the two-seat B-16, so you could take "the little girlfriend" along too.



OPPOSITE Igor Bensen enjoys a spot of fishing from Bensen B-8MW Hydro-Copter N63U at Cypress Gardens in South Carolina. Bensen himself test-flew every type the company built, and in 1967 set new world records for speed (51.26 m.p.h. — 82km/h), distance (82.8 miles — 133km) in a straight line and altitude (7,275ft — 2,217m) with a B-8M.

RIGHT For those who like to keep their feet dry — the Bensen Gyro-Boat was a development of the B-8 in which the free-turning rotor system, known as the Roto-Sail, was mounted in a standard dinghy. The result was — literally — a flying boat, and was towed into the air by a motor-boat. The prototype made its first flight in April 1956.



WINGS OVER PERU



This dramatic artwork by JERRY BOUCHER depicts the combat over the Algodón River between Peruvian Air Force Douglas O-38P 1/2-VG-4, flown by Lt Americo Vargas, and Curtiss Hawk IIs of the Colombian Air Force, on May 10, 1933. For more info on the artist, see www.the-vaw.com.

Jerry Boucher
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In the first part of a regular series on military aviation in Peru, **AMARU TINCOPA** takes an in-depth look at the career of the Douglas O-38P observation biplane in Peruvian Aviation Corps service. Designed as an armed reconnaissance type, the portly O-38P nevertheless acquitted itself well in combat during the Colombia-Peru War of 1932–33

THE HISTORY OF the Douglas O-38 in Peru begins with the seizure, by Peruvian forces, of the Colombian border town of Leticia — followed shortly thereafter by the fall of the garrison at Tarapacá — on September 1, 1932. This was followed by Peruvian President Colonel Luis Miguel Sanchez Cerro's announcement, on September 6, of his plan to deploy the armed forces in support of the militiamen's actions — a decision that was regarded by Colombia as a *casus belli*. With vast and inaccessible territories, the quickest way for either side to obtain victory in the green inferno of the Amazon rainforest was to secure air supremacy. Both countries quickly began an arms race to provide their military aviation services with the latest advancements in aerial warfare technology.

THE COLECTA NACIONAL

By the time hostilities broke out, the *Cuerpo de Aviación del Perú* (Peruvian Aviation Corps — CAP) could muster no more than ten combat-capable aircraft, comprising eight Vought O2U-1E Corsairs (survivors from an original batch of 12 acquired in 1930) and a pair of Vought UO-1As, plus a small number of transport and liaison biplanes. As the government did not have the necessary resources to acquire any machines, it appealed to the population via a *Colecta Nacional*

ABOVE Factory-fresh — one of the six Douglas O-38Ps supplied to Peru, complete with light-blue fuselage and vivid orange-red wings, applied to make them highly visible over the vast Amazonian forest landscape.

ALL PHOTOGRAPHS VIA AUTHOR

(National Collection) with the purpose of obtaining funds to purchase a number of aircraft, while endless debates over the authorisation for the external indebtedness of the country took place in Congress. A committee was appointed and tasked to manage the funds to be obtained nationwide; and, after a few weeks, enough money had been gathered to allow for small purchases or make first payments on a large scale. As the purchase of combat aircraft was the top priority — along with engines and spare parts for the Corsair fleet — the members of the technical commission assigned by the CAP to oversee the procurement process issued, by the end of October 1932, a report to the *Comité de la Colecta Nacional* (National Collection Committee — NCC) recommending the acquisition of the following items:

- 15 Douglas O-38 reconnaissance and light attack biplanes;
- ten Curtiss Model 35A biplane fighters;
- 200 x 50kg (110lb) demolition bombs;
- 600 x 25kg (55lb) demolition bombs;
- 1,200 x 25kg fragmentation bombs.

The NCC recommended both types of aircraft owing to their performance and availability, and



ABOVE The six O-38Ps were the only attack aircraft purchased by Peru's Cuerpo de Aviación that arrived in time to take part in the military actions over the Putumayo River on the Peruvian/Colombian border, the focus of much of the action during the Colombia-Peru War (sometimes called the Leticia War) of September 1932 to May 1933.

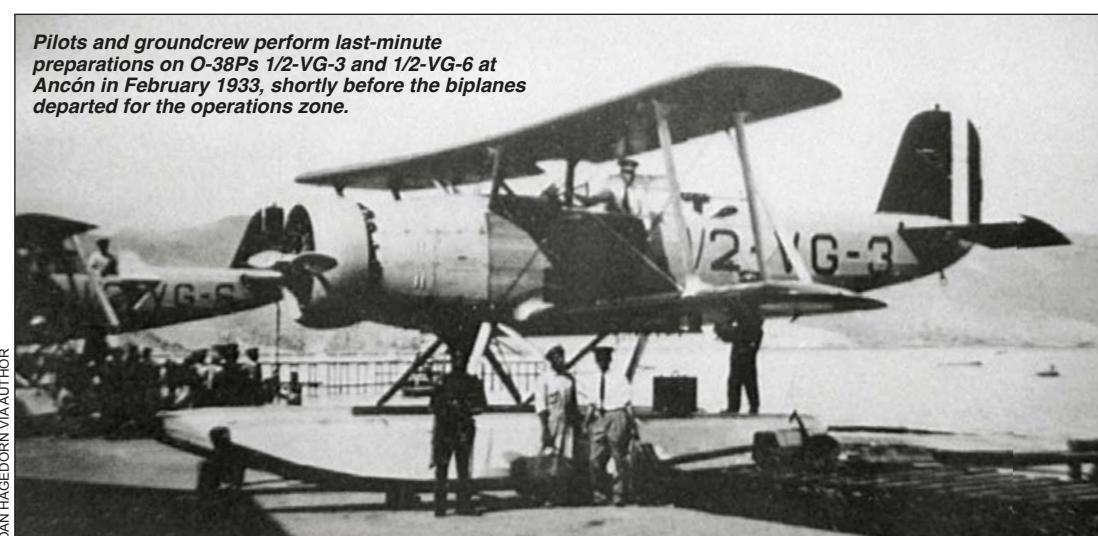
in strict compliance with the aircraft acquisition regulations issued by the CAP in 1929. These stated that combat aircraft were to be fitted with the same powerplant in order to simplify logistics, and in this particular case both the Curtiss and Douglas were powered by the same 575 h.p. Wright R-1820-E Cyclone engine. The committee, however, did not authorise the order, alleging that the amount of money raised to that date was insufficient to cover the total expenses, as the Peruvian Congress had failed to approve incurring a foreign debt. Additionally, the committee pointed out that the funds gathered by the Collection were only to be used for the acquisition of aircraft and not the purchase of bombs or other equipment. It was only after considerable pressure by the armed forces' high-ranking officers

that funds were finally granted. In the event, only three Curtiss Model 35A Hawk IIs and six Douglas O-38s were ordered, the latter via a contract dated October 17, 1932.

GO FOR WHAT YOU KNOW

The selection of the Douglas offering was neither random nor adventurous, as it was favoured by the CAP's previous experience with the company's DT-2B, four of which (c/ns 253, 254, 384 and 385) were bought in 1927 and operated by the (then) *Cuerpo de Aviación Naval* (Naval Air Corps). These had established a good reputation with Peruvian airmen owing to their sturdy construction, versatility and reliability. It has to be noted that several of the CAP officers that made up the ranks of the NCC were former naval aviators, a fact that prob-

Pilots and groundcrew perform last-minute preparations on O-38Ps 1/2-VG-3 and 1/2-VG-6 at Ancón in February 1933, shortly before the biplanes departed for the operations zone.



DOUGLAS O-38P DATA

Powerplant 1 x 640 h.p. Wright R-1820-F radial engine driving a two-bladed propeller

Dimensions

Span	40ft 0in	(12.19m)
Length (minus floats)	31ft 4in	(9.55m)
Height (minus floats)	10ft 8in	(3.25m)
Wing area	362ft ²	(33.63m ²)

Weights

Empty	3,070lb	(1,393kg)
Maximum	4,456lb	(2,021kg)

Wing loading	12lb/ft ²	(58.6kg/m ²)
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Power loading	8.3lb/h.p.	(3.8kg/h.p.)
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Performance

Maximum speed at sea level	150 m.p.h.	(241km/h)
Cruise speed	120 m.p.h.	(193km/h)
Climb rate	1,500ft/min	(457m/min)
Service ceiling	19,000ft	(5,790m)
Normal range	275 miles	(442km)

ably helped in tipping the balance in favour of the Douglas product.

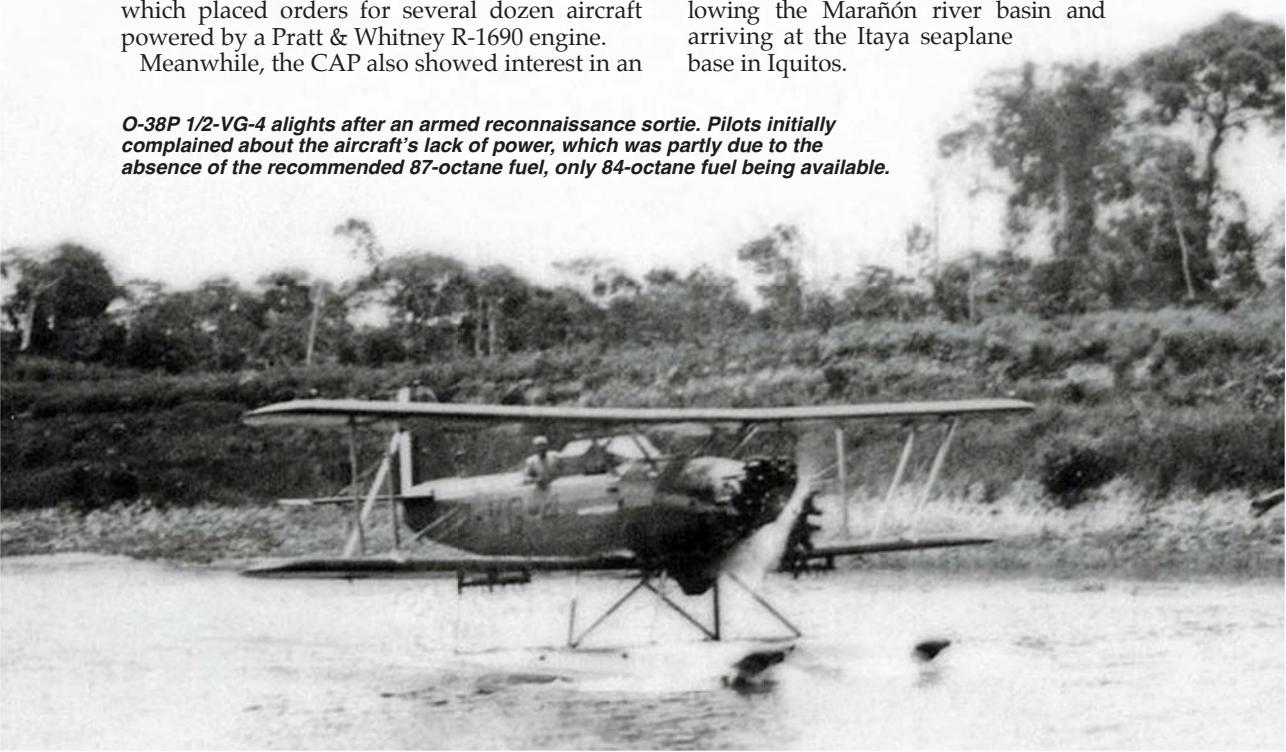
The O-38 was designed by the Douglas Aircraft Company as an observation biplane in the late 1920s. Substantial numbers of O-38s, in various versions, were operated by the US Army Air Corps, National Guard and Coast Guard Service. In 1932, as a private venture, Douglas modified an O-38C (c/n 1121) by increasing the fuselage volume, adding a completely enclosed canopy and fitting a more powerful 575 h.p. Wright R-1820E Cyclone radial engine, giving birth to the O-38S (for Sport) for the private market. The new variant caught the eye of the National Guard, which placed orders for several dozen aircraft powered by a Pratt & Whitney R-1690 engine.

Meanwhile, the CAP also showed interest in an

armed version of the O-38S and ordered six for a total of US\$190,000. This seemingly high price was the result of the numerous modifications requested by the CAP, which included a set of Edo floats for each airframe, the fitting of a radio and transmitter, bomb racks and machine-guns (one fixed firing forward and one on a flexible mount in the rear crew compartment, both modified to fire 0.303in/7.65mm ammunition) as well as the installation of a more powerful 640 h.p. Wright R-1820-F engine. Six O-38Es were modified on the production line to fit Peruvian requirements; after their completion they became the only examples of the O-38P (for Peru) and were identified with construction numbers 1141 to 1146.

After leaving the USA aboard the steamer *Ucayali*, the six crated O-38Ps arrived at the Peruvian harbour of Callao on January 8, 1933. They were immediately taken to Las Palmas air base in Lima, where assembly, testing and certification flights began under the supervision of Douglas personnel who had travelled with the O-38s. The aircraft were then accepted and taken into service with the newly activated *Segunda Escuadrilla de Información* (2nd Information Escadrille) from the recently created *I Escuadrón de Aviación* (First Aviation Squadron). They were then transferred to Ancón seaplane base in northern Lima Province in order to be fitted with floats and begin their preparation for their deployment to the forward area of operations. The six aircraft were to be deployed in two groups to the front, following the so-called "northern route" through the Ancón—Bayovar—Santa María de Nieva—Itaya route via the coastline and then across the Andes mountains, following the Marañón river basin and arriving at the Itaya seaplane base in Iquitos.

O-38P 1/2-VG-4 alights after an armed reconnaissance sortie. Pilots initially complained about the aircraft's lack of power, which was partly due to the absence of the recommended 87-octane fuel, only 84-octane fuel being available.



The deployment of the first escadrille, the O-38Ps of which were serialled 1/2-VG-2, 1/2-VG-4 and 1/2-VG-5, took place in February 1933. Aircraft 1/2-VG-2, flown by the formation leader, was fitted with a radio so the flight could be given weather updates by the ground stations set along the route. After taking off, the formation followed the itinerary with no incidents and reached Santa María de Nieva, where they awaited the arrival of a *Marina de Guerra del Perú* (Peruvian Navy — MGP) boat in order to refuel before continuing eastbound. The O-38Ps remained at that location until February 9, when the order to continue was issued. However, during its take-off run, O-38P 1/2-VG-5, flown by Lt Dañino, hit a submerged log and was subsequently written off. Fortunately the pilot escaped with minor injuries. The two remaining aircraft continued their journey, reaching Iquitos a few hours later, where they spent the night. The next morning, both aircraft left Itaya for Santa Isabel, where their crews established a provisional base.

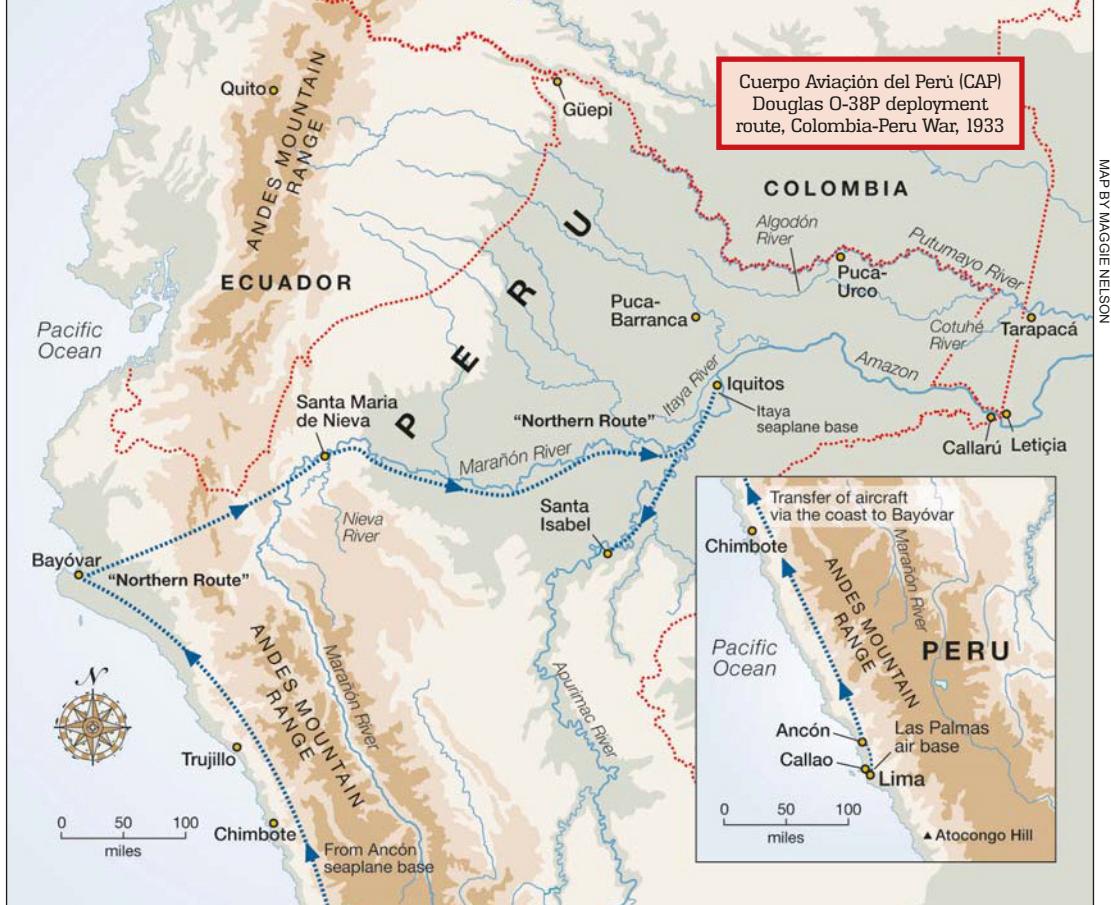
Shortly after the arrival of the first O-38P, the commander of V Division, head of all Peruvian military forces in the theatre of operations, expressed concern about the aircraft's highly visible colour scheme of international orange and light blue, which made them easily identifiable from the air. Consequently, an urgent request for the shipping of grey or green paint from stocks at Las Palmas was made from Iquitos, although the paint was not actually delivered to the front before the end of hostilities. On February 22 the three remaining aircraft — 1/2-VG-1, 1/2-VG-3 and 1/2-VG-6 — left Ancón for the area of operations, again following the northern route. Unfortunately, the Nieva River was again the location of an incident, this time with tragic consequences.

ABOVE RIGHT & BELOW *With the help of personnel from a Peruvian Navy river vessel, the remains of O-38P 1/2-VG-5 are recovered from the muddy waters of the River Nieva. The aircraft was transported to Pucallpa, where it was stripped of usable parts and scrapped.*



During take-off, the engine of 1/2-VG-6, flown by 2nd Lt Alfredo Rodríguez Ballón, lost power, causing the aircraft to crash into the nearby forest, killing its pilot and causing severe injuries to its gunner, Sub Officer Oscar Espejo. The remaining aircraft continued towards Iquitos, where they refuelled and then pressed on towards Pucallpa, where a forward base was established. An investigation was ordered by the CAP's High





Command to determine the causes of the engine malfunction; the results pointed to the low quality and octane of the fuel available as the cause behind the incident.

ON THE FRONT LINE

Meanwhile things were not going well for the Peruvians more generally: by March they had suffered the loss of Tarapacá and other small garrisons located along the Putumayo River. Their last remaining garrison in the river, Güepí, was now under direct threat from Colombian forces, which slowly progressed upriver towards it.

Numerous sorties were launched by the 2nd Escadrille against the Colombians threatening the Peruvian garrison. One of the most remarkable was flown on February 22, when a mixed formation of three Vought Corsair biplanes (serials 5-E-2, 5-E-4 and 5-E-6) and two O-38Ps (1/2-VG-2 and 1/2-VG-4) scrambled from their provisional bases at Santa Isabel and Callarú, respectively, and headed towards the Putumayo looking for any signs of Colombian river traffic, especially the river boat *Pichincha*, which had been sighted in the proximities of the Cotuhé river. Near Tarapacá the formation spotted several Colombian vessels protected by Curtiss Hawk II fighters of Colombia's *Aviación Militar* (CAM).

The Peruvian aircraft, devoid of fighter escort, pressed home their attack despite the odds and

near misses were reported near the *Pichincha*, causing light damage. During the rather uneven air combat that ensued, four Peruvian aircraft sustained light damage and two crew members were injured, Lt Ismael Merino and Sub Officer Mario Dolci, gunners of O-38P 1/2-VG-2 and Corsair 5-E-6, respectively, both receiving bullet wounds. The Colombian Hawks, however, were unable to achieve any kills and gave up the chase owing to the determined defensive fire put up by the Peruvian gunners.

March 17, 1933, saw the first escort mission by a pair of Hawk II biplane fighters, recently arrived in the operations area, when a mixed formation of three Corsairs and three O-38Ps scrambled from Puca-Barranca for the Colombian garrison at Tambo de Hilario on the river Cotuhé, to attack the Colombian forces deployed there. The urgency of this sortie forced the mission to be launched at 1700hr, with the formation arriving over the objective after almost an hour of flight. During the attack, undertaken in fading light, the Peruvian formation dropped a total of 540kg (1,190lb) of bombs over its intended targets: a Colombian vessel and ground positions located nearby, causing the withdrawal of the Colombian fleet downstream. Another mission was launched at 0500hr on March 20 against Colombian vessels and ground positions located around the Peruvian garrison at Güepí. The CAP formation — comprising three



A poor-quality but rare photograph of a formation of Colombian Curtiss Hawk IIs, probably over the Caquetá region of Colombia. The floats caused a marked decrease in the fighter's performance, but runways were in short supply in the Amazonian rainforest.

DAN HAGEDORN VIA AUTHOR

Corsairs and four O-38Ps belonging to the 8th and 10th Observation Escadrilles respectively, escorted by a pair of Hawk II fighters — successfully attacked their targets owing to the lack of opposition from the CAM.

On March 26, 100 men of the so-called "Putumayo detachment", brought by the Colombian expeditionary fleet, began their assault on the Peruvian garrison of Güepí under air support provided by 11 CAM aircraft. The Peruvian Army troops, dug into elaborate defensive positions, held the Colombian assault for eight hours before withdrawing to the forest, leaving significant equipment behind. On April 20 three O-38Ps from the 2nd Observation Escadrille took off from their forward base at Puca-Barranca bound for the Yubinete river mouth, where they attacked the Colombian transport boat *Emmita* with good results. A similar mission was launched on April 22, this time against the transport boat *Sinchi Roca*, operating in the surroundings of Güepí.

The high number of operations undertaken by the CAP units deployed over the conflict area naturally caused a progressive reduction in the availability of aircraft owing to wear and tear. The V Division commander needed to conserve the momentum of the operations and consequently, by the end of April, all surviving Vought, Douglas

and Curtiss aircraft were reassigned to a single unit, to be known as the *Escuadrón Mixto de Aviación* (Mixed Aviation Squadron).

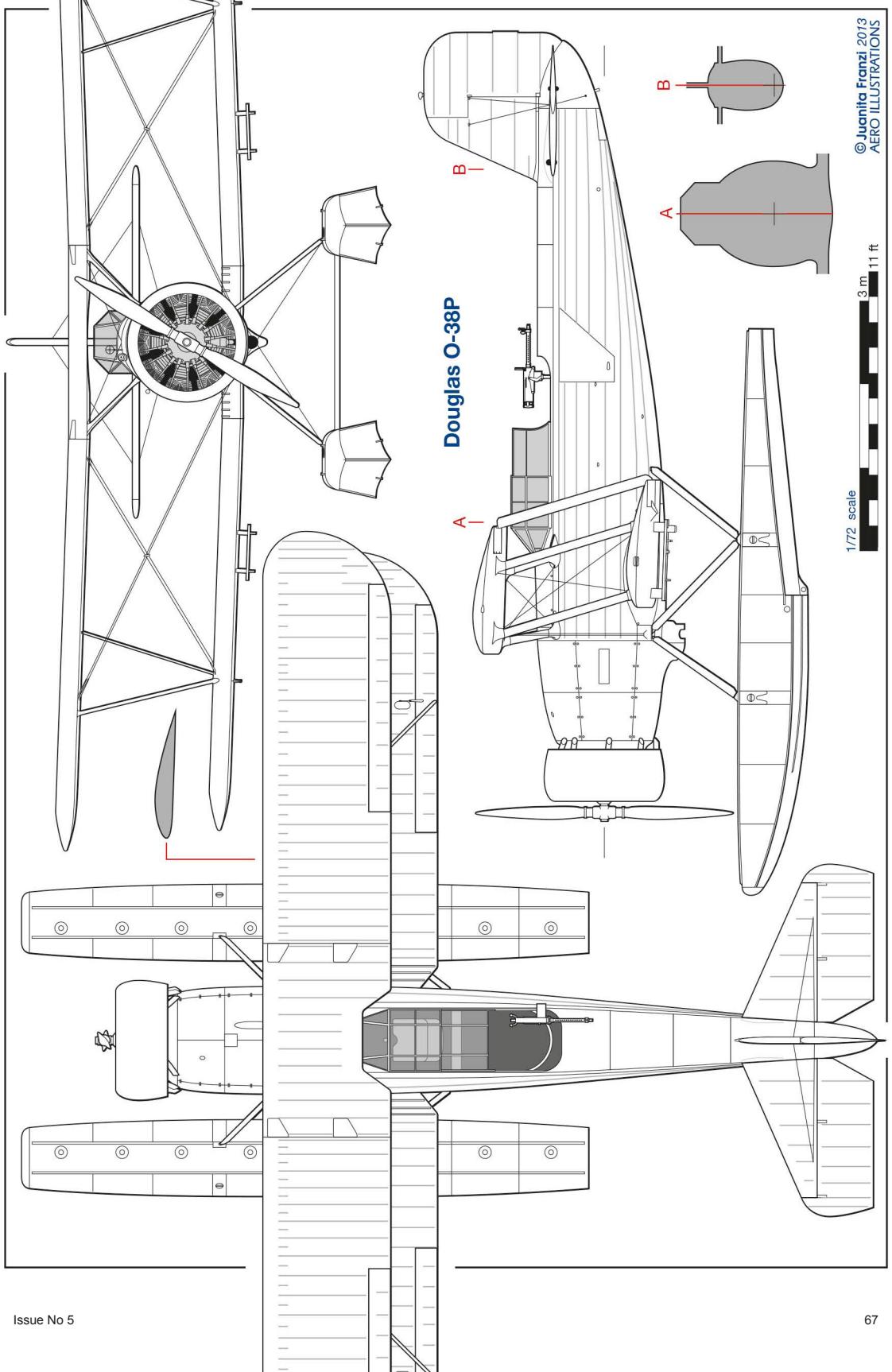
INTO COMBAT

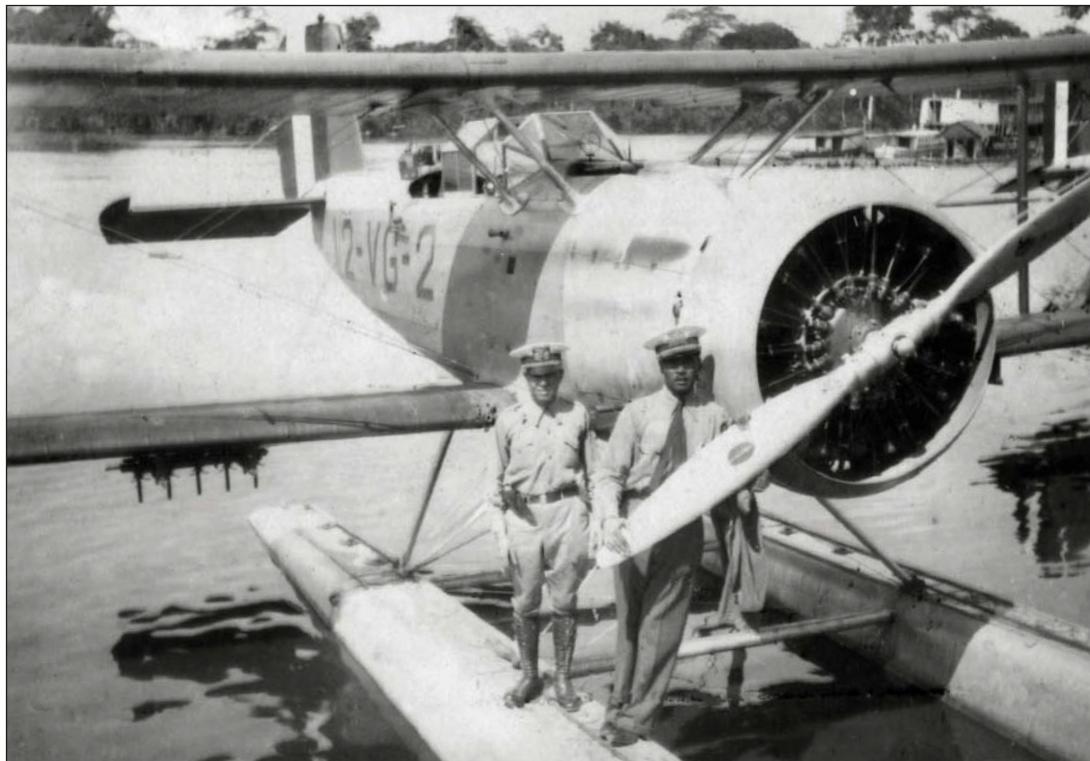
After learning about the attacks on the *Emmita* and *Sinchi Roca* boats, the Colombian public immediately aimed its criticism towards German Col Herbert Boy, head of Colombia's Expeditionary Aviation Force, as well as Gen Vásquez Cobo, chief of the Colombian Military Expedition, and questioned their competence during the military operations in the Putumayo. It is worth noting that the alleged "inaction" by a sector of the CAM owed as much to technical and operational factors, such as operating biplane fighters from unprepared strips, as anything else. These issues were also experienced, albeit to a lesser degree, by the CAP. Neither Colombian nor Peruvian Curtiss Hawk IIs were fitted with electric engine starters, and so had to be manually started by groundcrew, which caused considerable delays in the response time of the defenders.

Stung by the criticism and eager to crush the CAP's will to fight, on May 9 Boy ordered his fighter pilots to maintain a constant state of readiness in order to be able to react the moment the Peruvians showed up. This measure set up the

O-38P 1/2-VG-4 leaves Puca-Barranca on another reconnaissance sortie armed with four 25kg (55lb) bombs. It was this aircraft that would be lost during combat with Colombian Hawk IIs on May 10, 1933.







ABOVE A pair of unidentified Cuerpo de Aviación officers pose on the starboard Edo float of O-38P 1/2-VG-2 at Puca-Barranca. Although the aircraft were delivered brand-new and had been in service for only a comparatively short time, the wear-and-tear on the airframes as a result of intensive operations is apparent here.

conditions for one of the most remarkable air-to-air combats of the campaign.

At 0900hr on May 10 a formation of the Mixed Squadron, comprising O-38Ps 1/2-VG-1, -2 and -4, took off from Puca-Barranca heading for Puca-Urco, on the Putumayo River, to harass Colombian river traffic in the area. As in previous attacks, the Peruvian pilots put their hopes in the element of surprise — owing to other frontline requirements, there was to be no fighter escort.

After some 30min flying time, the Peruvian formation arrived over Puca-Urco. Its pilots were unpleasantly surprised to find an escadrille of three Colombian Hawk II fighters already waiting for them. With the odds clearly against them, the Peruvian formation leader ordered the other pilots to jettison their ordnance and head back for Peruvian territory. This time, however, the Colombian fighters had the altitude and airspeed advantage and soon were near firing distance. At this point, in an act of great courage, Lt Americo Vargas, pilot of O-38P 1/2-VG-4, broke formation and headed towards the Colombian fighters, luring them into pursuit, thus allowing the remaining Peruvian aircraft to leave unscathed. They arrived safely back at Puca-Barranca at 1235hr.

In the ensuing mêlée, Vargas and his gunner, Sub Officer Octavio Mendez, confronted a superior number of enemies. Vargas furiously manœuvred

the big biplane, while Mendez made good use of his movable Browning 0.303in (7.65mm) machine-gun. The Peruvians held the attackers at bay for about 5min as the heavily-loaded Hawks were unable to manœuvre into firing position, a factor brilliantly exploited by the Peruvian pilot. The odds, however, were very much against the O-38P crew and the aircraft began to receive multiple hits. Both Vargas and Mendez were wounded. Facing certain death, the pilot pushed the control column forward and headed for the surface of the water, quickly alighting on the Algodón River. He and Mendez abandoned the stricken aircraft and disappeared into the jungle. From their hiding place they watched as their O-38, its floats riddled with bullets, sank (to be retrieved later by a Colombian vessel). After evading capture by entering deeper into the forest, Vargas and Mendez spent the night at large and returned to the river the next morning, where they awaited the arrival of a Peruvian Navy fast boat, which rescued them.

POST-COMBAT CAREER

On May 23, 1933, a ceasefire between Colombia and Peru was announced, brokered by the League of Nations. The subsequent Resolution recognised Colombia's rights over the disputed territories in June 1934. The Peruvian authorities, led by President Gen Oscar Raimundo Benavides,

accepted the decision and allowed for provisions for a peace treaty which normalised relations between Lima and Bogotá.

With the demilitarisation process under way, the surviving O-38Ps — including 1/2-VG-4, which was returned by Colombia in late June 1934 — departed for the capital for inspection and repair at the Ancón seaplane base, where they arrived in late August 1934. After this was completed, the four remaining aircraft were assigned to the newly-activated *Segunda Escuadrilla Mixta de Observación* (Second Mixed Observation Escadrille) based at Ancón, receiving the serials 2-O-5 to -8. This unit, however, was short-lived. It was soon disbanded and three of the O-38Ps were assigned to the *Segunda Escuadrilla de Bombardeo y Observación* (2nd Bombardment and Observation Escadrille — 2nd EBO) of *IV Escuadrón de Aviación* (IV Aviation Squadron), based at Ancón. The fourth O-38P was sent to Las Palmas to be assigned to the *Escuela de Aviación Militar* (Military Aviation School — EAM) "Jorge Chavez" as an advanced trainer with the serial E/BO-2.

Tragedy continued to dog these O-38s' service records when, on January 30, 1939, E/BO-2 crashed into Atocongo Hill, two miles from Las Palmas, owing to engine failure. Its pilot, 2nd Lt Julio Ganoza, flying solo, was killed. As a result, one of the O-38Ps at Ancón was sent to Las Pal-

mas to maintain continuity in the training process. This machine became E/BO-10.

In June 1939 the CAP was reorganised; all its units were disbanded and new ones formed. The 2nd EBO was no exception and its former aircraft found their way into the 84th Escuadrilla of the *XXXII Escuadrón de Información Marítima*, with which they served alongside four Fairey Seals until late September, when they were finally withdrawn from active service and sent to Las Palmas. From there they were sent to the Caproni works to undergo inspection and overhaul before being assigned to the EAM at Las Palmas. There, they were assigned to the fourth section of *V Escuadrón de Instrucción* (V Instruction Squadron), receiving the serials I-4-8 to I-4-10, and continued to serve as bomber trainers for CAP student pilots.

In mid-1940 an inspection of the O-38P airframes was ordered, the subsequent report indicating that they had reached the limits of their operational life; consequently they were withdrawn from active duty and used as instructional airframes before being scrapped. After long and valiant service, the big biplanes had come to the end of their story.



Amaru Tincopa is the author of the forthcoming book Peruvian Air Corps Operations Over The Putumayo, published by Artipresse (www.artipresse.com)



ABOVE A group of CAP trainee pilots at the Escuela de Aviación Militar relax around an O-38P (probably the second example to serve at the school, E/BO-10) of V Escuadrón de Instrucción at Las Palmas in 1937. Peru continued its connection with Douglas, using 8A-3Ps (export Northrop A-17s) from 1939 and A/B-26 Invaders during 1954-62.

FALKLANDS CONFIDENTIAL

When Argentina invaded the Falkland Islands in April 1982, the British government was determined to fight. But what position would the USA, Britain's long-standing ally, take? Using documents recently declassified by the UK's National Archives, **BEN DUNNELL** reveals some of the intriguing plans mooted in the corridors of power during the conflict



LEFT The British Prime Minister, Margaret Thatcher, addresses the nation in a press conference at Downing Street on June 9, 1982, the day after the bombing of the British landing ships Sir Galahad and Sir Tristram by Argentinian A-4 Skyhawks. Beside her is the American President, Ronald Reagan, who was committed to supporting the British cause.



TERRY, WE NEED *Ark Royal*." So wrote Admiral Isaac Campbell "Ike" Kidd, then SACLANT (Supreme Allied Commander of the Atlantic Fleet), to Britain's First Sea Lord, Admiral Sir Terence Lewin, in February 1978. His concern? That the impending retirement of *HMS Ark Royal* (R09), the last of the Royal Navy's "flat-top" aircraft carriers, would leave in Nato's maritime capability a significant, possibly a crucial, gap. "By the end of 1978," said Kidd, "we sailors will be faced with a requirement/resources problem that keeps me awake at night... I ask that the most serious consideration be given to my request that *Ark Royal* should continue beyond 1978 for as long as possible in the active Fleet."

It did not come to pass. Kidd would just have to live with his sleeplessness, while the Royal Navy waited for a return to the fixed-wing carrier-borne combat aircraft game. With the Cold

War still central to defence planning, it would be a nervous few years. And when the call to arms came, unexpectedly in the South Atlantic instead of the North, still Britain's carrier gap had not entirely been filled. This situation gave rise to a decidedly odd proposal, one brought to the fore through declassification in December 2012 under the 30-year rule of UK government papers relating to the Falklands War. Far from the USA urging Britain to keep a carrier, now it was offering the loan of one.

AMERICA AND THE FALKLANDS

The familiar narrative regarding American attitudes to the South Atlantic conflict has it that the USA was, shall we say, not as ill-disposed towards the Argentinian aggressor as Britain would have liked. Of course, this ignores the fact that never before or since has a relationship between British Prime Minister and American

One of the plans proposed during the Falklands conflict was the use of the American aircraft carrier USS Dwight D. Eisenhower (CVN-69) for British aircraft operations should the need arise. British Aerospace Sea Harriers would ultimately see operations from the carrier, these No 800 Naval Air Squadron FRS.1s being seen aboard the Eisenhower during an exercise in October 1984.

US NAVY





ABOVE LEFT Sir Nicholas "Nicko" Henderson, the British Ambassador to the USA at the time of the Falklands conflict, was a close personal friend of President Reagan and helped to foster the "special friendship" between Thatcher and Reagan. ABOVE RIGHT Alexander Haig, the American Secretary of State during the Falklands War.

President been as close as that between Margaret Thatcher and Ronald Reagan. It also neglects to consider what actually happened, a story told — at least in part — through the papers now to be found in The National Archives.

THE AMERICAN PERSPECTIVE

A degree of context is required here. The USA's position towards the Falklands conflict was more complex than is often credited. After all, it was dealing with a situation involving both one of its longest-standing allies and another country on the American continent. In public there was a need to maintain a stance calculated not further to inflame the crisis caused by Argentina's invasion of a British sovereign territory. In private, things were rather different. Take the reaction to an entirely inaccurate report on ABC television news on April 6, 1982, four days after the

Argentinian landings, that a USAF Lockheed SR-71A reconnaissance aircraft had performed intelligence-gathering sorties over the Falklands ten days before the invasion, and done so at Britain's request. More than that, the item stated, the Blackbird missions were ongoing.

In a telegram, the then British Ambassador to Washington, Sir Nicholas Henderson, reported to the Foreign Office: "Haig has just telephoned me about this story, telling me how mischievous it can be in the light of the present criticism in the UK". Haig, of course, was the American Secretary of State Alexander Haig, then undertaking a round of shuttle diplomacy between the warring parties. In a subsequent telegram Henderson told his superiors that Haig and the American Defense Secretary, Caspar Weinberger, "had a most useful talk today. They were determined to stop the talk about the USA being neutral. It was monstrous to

TAH ARCHIVE

Hawker Siddeley Harrier GR.3 XZ963 aboard HMS *Hermes* during the conflict. This aircraft saw combat against Argentinian helicopters and ground positions before being lost as a result of small-arms fire on May 30, 1982. The pilot, Sqn Ldr Jerry Pook, ejected into the sea and was rescued by a Royal Navy Sea King.



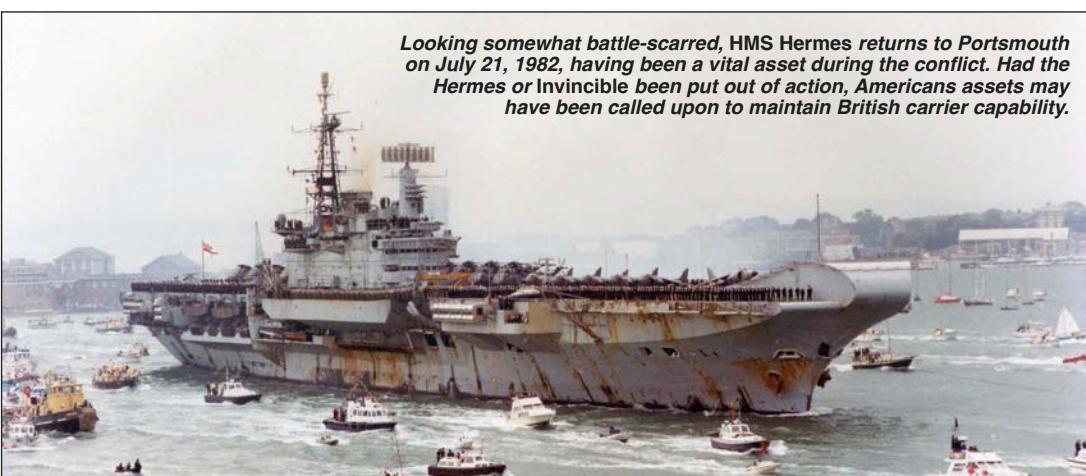


ABOVE LEFT Haig and Thatcher during the latter's visit to the USA at the end of June 1982. Haig conducted shuttle diplomacy between Buenos Aires and London in the early stages of the conflict, but, by mid-April 1982, negotiations had broken down. ABOVE RIGHT Caspar Weinberger, the US Secretary of Defense during 1981–87.

put a long-standing ally on to the same level as Argentina. There were ways of helping without any publicity that he would undertake. I had only to get into touch with him if there was anything we wanted him to do. It was nonsense to talk about neutrality when Britain was concerned, and Argentina had committed aggression".

There followed further discussion in London about how this offer might best be taken up. By the end of April 1982 a paper had been prepared by one of the Assistant Chiefs of the Defence Staff entitled "Operation Corporate: US Assistance", in which areas of potential help were identified. At its outset were laid down a number of assumptions, chief among which was the following: "The US would not be prepared to participate with the UK in operations against the Argentine [sic]". Furthermore, this section went on, "HMG [Her Majesty's Government] would

not wish to embarrass the US Administration by requesting measures of support for which Congressional approval could not be achieved. Lend-Lease of ships and aircraft might fall into this category". The section listing those areas in which the USA could potentially assist begins: "The Lend-Lease of a US attack carrier for Harrier GR.3 operations would add significantly to the overall capability of the UK Task Force and to its sustainability, despite the practical difficulties involved. It would, however, have a high political profile and it might be prudent to exclude it from an initial UK approach". Rather, the document went on to outline areas in the fields of intelligence, communications, indirect operational support, logistic support and weapons, equipment and materiel supply. At all times, expectations were moderated: it was "probable", the document says, "that the US would be reluctant to offer air-



TAH ARCHIVE

to-air refuelling support for offensive air operations" in spite of how valuable this would have been, although a request for additional air transport, "especially [Lockheed] C-5As", was deemed more reasonable.

A MOBILE LANDING STRIP AT SEA?

None of this stopped the carrier idea from being discussed. In a special commemorative supplement paying tribute to former Prime Minister Margaret Thatcher upon her death in April 2013, *The Sunday Times* published an article by Robin (now Baron) Renwick, Head of Chancery at the British Embassy in Washington at the time of the Falklands War. In it he wrote: "Weinberger was so concerned about the critical gap in our military capabilities — the lack of a large aircraft carrier — that he appeared at the embassy one morning to suggest that we might lease one from the United States". In his diary memoir *Mandarin* (Weidenfeld & Nicolson, 1994), Sir Nicholas Henderson recalls this meeting as having occurred "when Weinberger took me aside at a party at the British Embassy". Whatever, the offer, described by the British diplomat as one "of spontaneous and practical generosity that must be unique in the annals of the Washington-London relationship", was reported back to the Foreign Office in the following telegram from Henderson dated May 3, 1982:

"In the few minutes I had with Weinberger while the Secretary of State was called away to talk to Haig he spoke to me of his eagerness to give us maximum support. He was really waiting to hear whether he could help by sending down a carrier. It would take 15 days for it to get to

the South Atlantic. He had the [USS *Dwight D. Eisenhower*] marked for the task. It was now just off Gibraltar. What he was thinking was that it might serve as a mobile runway for us. This would not mean that the US forces were going to be engaged against the Argentinians. I said that I supposed US reconnaissance 'planes could fly off the carrier and provide information for us. As regards our own landing requirements I was sure it could be of great importance to have, as it were, a mobile landing strip. How would he view the idea of [Blackburn] Buccaneers using the carrier, manned of course by the RAF? Weinberger seemed to have no trouble with the idea."

Well, maybe; but it seems likely that neither Henderson nor Weinberger was fully aware of the effort required to make such a thing possible. Even those ex-Fleet Air Arm Buccaneer pilots who had carried on flying the type with the RAF were by now far from carrier-current, to say nothing of their colleagues with no naval background. Clearly the idea was impractical. Robin Renwick notes as much, and an unidentified official's scrawled comment on Henderson's original telegram agrees, saying, "I think this is crazy, and so, oddly enough, does CNS to judge from his remarks this morning". CNS is a reference to the Chief of Naval Staff, a title held by the First Sea Lord, at that time Admiral Sir Henry Leach. Another handwritten note on the document concurs, adding that the Ministry of Defence's views on the proposal would not be sought. Indeed, it does not seem to be mentioned again in the relevant files. The idea of RAF Buccaneers flying from a US Navy aircraft carrier would remain a wild pipedream.

"Mighty Ike" — the nuclear-powered USS Dwight D. Eisenhower (CVN-69) is one of the ten Nimitz-class aircraft carriers built, all of which are still in service in 2013. Recently-declassified documents reveal that proposals to operate RAF Buccaneers from the Eisenhower were considered during the Falklands conflict.

US NAVY



WOT, NO BUCCANEER? ALL DRESSED UP WITH NOWHERE TO GO . . .

EVEN IF NOTIONS of RAF Buccaneer operations from the *Eisenhower* during the Falklands War were never likely to be followed up, the brutish strike aircraft could still have played a part in Operation *Corporate*. Towards the end of April 1982, No 12 Sqn at RAF Lossiemouth received word of potential involvement. "The last ten days of April was a busy and uncertain time for the squadron", its Operations Record Book (ORB) notes. "Certain preparations were made and cancelled for possible actions in connection with the crisis in the Falkland Islands."

The unit's commanding officer, Wg Cdr Yates (ex-Fleet Air Arm), added: "Many enquiries have been made by higher formations about possible 12 Sqn involvement as a result of the Falkland Island troubles. Investigations have been made in various depths on (a) Buccaneer maritime attacks from Ascension Island using AAR [air-to-air refuelling] support; (b) Buccaneer presence on Gibraltar during the period of tension; (c) Buccaneer presence on Falkland [sic] after the Islands have been retaken; (d) Buccaneers in the AAR role assisting the tanker force, which is heavily committed in the southern hemisphere. At the moment there is natural frustration that one of the country's main ship-attack system [sic] cannot be used in the naval scenario off Falkland Island [sic]."

It came to naught, despite No 12 Sqn being instructed on May 26, 1982, to prepare four aircraft, six aircrews and support personnel for deployment. "This is part of a plan to establish a garrison at Port Stanley should it be required once the Islands are again under British control", says the ORB. The garrison was required, but the Buccaneers were not, the presence of Harrier GR.3s and Phantom FGR.2s being deemed sufficient. **BD**



TAH ARCHIVE

Tough as nails and in a class of its own at low level, the Blackburn (later Hawker Siddeley) Buccaneer may well have proved an invaluable maritime strike asset during the Falklands War, but in the event it was not called upon to serve in the conflict. Here a pair of Buccaneer S.2Bs of No 237 Operational Conversion Unit are captured in the type's element — fast and low.



ABOVE The American assault ship USS *Iwo Jima* (LPH-2) in 1979. It was in the Caribbean at the time of the Falklands conflict, and it was proposed that it could be sent to the South Atlantic and used for British Harrier and helicopter operations against the Argentinians — although the American crew would have to be “advisors” only.

But this was far from the end of the story. While several of the key players in relation to these events — Henderson, Leach, Weinberger, Haig — are no longer with us, there are still many important retrospective insights to be gained. Admiral James A. Lyons Jr (INSET RIGHT) was Commander of the US Second Fleet, and became heavily involved in another proposal, this time relating to the potential use of an *Iwo Jima*-class amphibious assault ship by British helicopters and Harriers had either *HMS Hermes* or *HMS Invincible* been lost. In an interview in May 2013 he told the author: “The *Eisenhower* issue never, let’s say, filtered down to the Commander of Second Fleet, which was my command at the time. But I knew about the *USS Iwo Jima* possibility. I was alerted to the possibility of making it available, and I made certain preparations in the event of that actually coming to pass. With the losses the British fleet was sustaining down there at the time, I think Margaret Thatcher said that if you lost one more ship you would have thought about calling off the operation.

“The *Iwo Jima* was with me down in the Car-



ibbean area where we were conducting exercises, so it was the most immediately available option: it was ready, it was at sea. We looked at certain crew members we would keep on the ship to help operate it: what we would need to ensure its good, continued operation.”

As has been stated by both “Ace” Lyons and the then US Secretary of the Navy, John Lehman, these individuals would probably have been used on a “contract advisor” basis so as to avoid direct American military involvement in offensive operations. There does not, so far as the author can find, appear to be any reference to the *Iwo Jima* proposal in the declassified National Archives files, but perhaps this is not surprising when one considers Lehman’s

comments in a speech made in Portsmouth last year: “We would leave the State Department, except for Haig, out of it. As in most of the requests from the Brits at the time, it was an informal request on a ‘what if’ basis, Navy to Navy”.

Of course, it never came to pass, so the issue of how American personnel would actually have been retained aboard the ship was not fully explored. As a Foreign Office document outlining



ABOVE Sea Harrier FRS.1s XZ451 (nearest) and ZA176 both participated in Operation Corporate, the former using its AIM-9L Sidewinders, which it is seen carrying here, to shoot down several Argentinian aircraft, including a Canberra on May 1, 1982, and a Hercules on June 1. BELOW A united front; kindred spirits Thatcher and Reagan.

the USA's offer of a stores ship, the *USNS Sirius*, for Operation *Corporate* use makes clear, "this is principally a question for the Americans . . . our own attitude to this point should take fully into account the great operational advantages". In the event of the Royal Navy losing a carrier, such advantages would certainly have been conferred by the *Iwo Jima*-class vessel itself, that type of ship having already been qualified for operations by US Marine Corps AV-8A Harriers. It was, as Admiral Lyons says, "half-way there and ready to go". He also stresses that the practical difficulties inherent in the US Navy and Royal Navy coming together to employ the ship in the South Atlantic would have been minimised by the extent of previous joint operations.

"GIVE MAGGIE EVERYTHING SHE NEEDS . . ."

Undeniable, when one examines the archive papers, is the sincerity of Reagan's statement to Weinberger: "Give Maggie everything she needs". This had perhaps its most potent expression in the urgent supply of 100 (according to Lawrence Freedman's *Official History of the Falklands Cam-*

paign, Volume 2; Renwick claims 105) AIM-9L Sidewinder air-to-air missiles for the Royal Navy's Sea Harrier force, the missiles supposedly drawn from USAF war stocks already present in Europe. Other procurements were similarly rapid, as the Pentagon, Freedman recounted, "managed to dispense with some 15 stages in the normal authorisation process."

That same willingness to assist Britain in its hour of South Atlantic need led to the carrier offer. One is left in little doubt from talking to Ace Lyons that Royal Navy use of the *Iwo Jima*-class carrier was considered a practical proposition by him, by Lehman and by others involved. How it would have functioned in reality, we will never know. The Falklands War

may well have been "a damn close-run thing" as Major-General Jeremy Moore famously said, but thankfully not quite so close-run as to result in the loss of a Royal Navy aircraft carrier. Britain never needed the *Iwo Jima* — but the knowledge that it was waiting in the wings, and backed at the highest level in Washington DC, must have been of some comfort to those few who knew.





Any port in a storm...

FROM

QANTAS EMPIRE AIRWAYS

SHELL HOUSE, CARRINGTON ST., SYDNEY.

One of the arguments advanced in favour of using flying-boats for the Empire Air Mail Scheme was the inherent safety advantage of being able to alight on any suitable stretch of water in an emergency. **PHIL VABRE** relates how the concept was put to the test in 1939, when a Qantas Empire flying-boat had to put down on a Java river in bad weather

IN AUGUST 1938 Stage 3 of the Empire Air Mail Scheme (EAMS), the section from Singapore to Australia, came into operation. This bold scheme to improve communications throughout the British Empire by dramatically cutting the price of sending mail by air had as its foundation the creation and operation of a fleet of large, modern marine aircraft: the Short S.23 Empire Flying Boats. Proponents of the Scheme argued that using flying-boats would avoid the need for costly upgrades to aerodromes, which at that time in many cases were small and poorly surfaced.

With large bodies of water along most of the routes from England to South Africa and Australia, it was also argued in those days of unreliable aero-engines and rudimentary weather forecasting

that flying-boats offered the possibility of making an emergency alighting on any suitable stretch of water. Was this really true?

Singapore-bound

On Boxing Day 1939, Qantas Empire Airways (QEA) Captain Russell B. Tapp, with First Officer J.L. "Len" Grey, encountered weather which demonstrated both the inherent flexibility and vulnerability of the flying-boat.

The pair had departed Sydney three days earlier on the normal service to Singapore, coincidentally SW200, the 200th westbound EAMS service, in Empire flying-boat VH-ABD *Corio*. The weather had been good, although the monsoon was expected to break at any time, bringing with it the usual severe tropical weather. Flying the Darwin—Sour-

Short S.23 Empire VH-ABD, named Corio, in service with Qantas Empire Airways at Karumba, Queensland, circa 1938. The brainchild of Arthur Gouge, the Empire represented a quantum leap in flying-boat design, offering previously unheard-of levels of comfort for passengers and crew alike.

IMAGES VIA AUTHOR UNLESS OTHERWISE NOTED





ABOVE Short S.23 G-AEUA Calypso (later the RAAF's A18-10), and Corio at 108 Berth at Southampton Docks in 1938. Both aircraft have been docked in Braby Pontoons, which allowed the passengers to walk to their aircraft and made freight-loading a much easier process than back in Australia, where the facilities were somewhat cruder.

abaya stretch on Christmas Day, crew and passengers enjoyed luncheon on board at midday. "No effects of war had reached this part of the world and Christmas fare was arranged for the passengers," Tapp (INSET) later recorded. However, "during the night, severe storms burst over Sourabaya and the following morning when we left for Batavia [now Jakarta] at the crack of dawn, the weather was definitely bad, but the terminal forecast for Batavia was all right. We anticipated running out of the murk some 100 miles [160km] before Batavia".

In contrast to the previous days, Corio flew through heavy cloud and rain until, as forecast, about 65 miles (105km) from Batavia, it flew into clear weather. Unfortunately the clear area lasted only ten miles (16km) or so and once again Corio entered cloud. Expecting to pass through it fairly quickly, the crew and passengers instead found that the cloud was more widespread than forecast.

Homing on Batavia using direction-finding equipment, they were unable to find a break by the time they were overhead. Tapp decided to return to the clear area, where they descended and positioned themselves over low ground before once again setting course for Tandjung Priok, Batavia's harbour, at 300ft (100m). Again they flew into cloud and saw nothing except a single tiny hole through which Tapp recognised a pylon at the entrance to the harbour.

Turning about again, it was obvious that the

clear patch was closing in quickly. With all the backtracking, fuel was running low. Luckily a river ran through the middle of the clear patch, in which was a straight reach, about a wingspan-and-a-half wide, long enough for Corio to alight. Dismissing the option of a "blind" alighting on the open sea because of the danger posed by fish traps, which were common in the area, Tapp made a tight circuit and skilfully alighted on the Tjitarum (now Citarum) River, east of Batavia.

Clinging on

Corio had no sooner dropped anchor in mid-river between low, grassy banks when the skies opened; rain bucketed down and the clear patch vanished. Although all was secure for now, Tapp knew that the anchor could not hold indefinitely against the rapidly-flowing river, especially since the current was carrying debris, including large logs, towards them.

In short order, branches accumulating on the mooring-rope threatened to dislodge the anchor's tenuous grip on the river bottom. Other flotsam endangered the hull while crew members "performed acrobatic feats with and without the boat-hook to dislodge them". Downstream, the river narrowed at a sharp bend between high timbered banks about 400yd (365m) away. If Corio was swept down on this bend, it would inevitably be badly damaged at the very least.

Despite the foul weather, a big crowd of locals had collected on the banks to goggle at the novel





PHILIP JARRETT COLLECTION

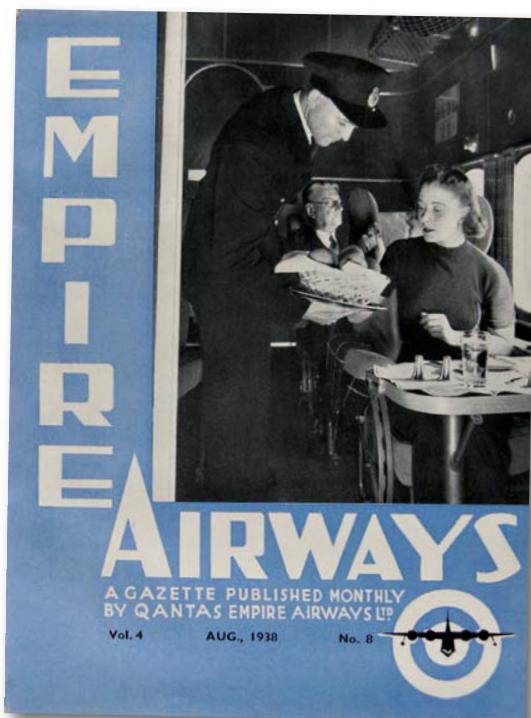
ABOVE The first of the Qantas Empire flying-boats to be used over the Singapore—Brisbane section of the Empire Air Mail Scheme, VH-ABA Carpentaria, arrives at Southampton from the Short factory at Rochester on December 5, 1937. Within days the aircraft had departed Southampton for Karachi, and on to Australia to enter service.

BELOW RIGHT The August 1938 edition of the Qantas Empire Airways monthly in-house gazette, the cover photograph emphasising the comfortable and spacious passenger accommodation offered by the Empire flying-boats. Competitor KLM/KNILM's land-based Douglas and Lockheed airliners seemed cramped in comparison.

sight of a large modern aircraft on their river. Three or four native boats soon appeared and tied up by the bank. Urgently needing a boat to come out to clear the debris off the rope, Tapp had everybody aboard shout "Sampan! Sampan! Sampan!" until they were hoarse, "... but not a sampan moved. The sampan wallahs just looked at us with apparent blank amazement". Tapp learned later that if they had shouted "Prau!" instead, they would have got the result they were after.

As the situation grew increasingly serious, Capt Tapp and his First Officer started the outboard engines to hold *Corio* against the current and let them re-anchor. They did this repeatedly, alternating between outboard and inboard engines to avoid overheating, and managed to avert disaster.

After alighting, Radio Officer F.S. "Frank" Furniss had started the flying-boat's innovative but temperamental auxiliary motor-generator, kept in a fireproof box by the Radio Officer's station. This small petrol engine drove a generator to provide power to the radio and charge the aircraft's accumulators (batteries). Ever since *Corio* had alighted, Furniss had been sending messages, without much success, to Batavia Aeradio, callsign "POA", to let them know the flying-boat was down safely and also to get a message through to



SHORT S.23 EMPIRE FLYING BOAT VH-ABD CORIO

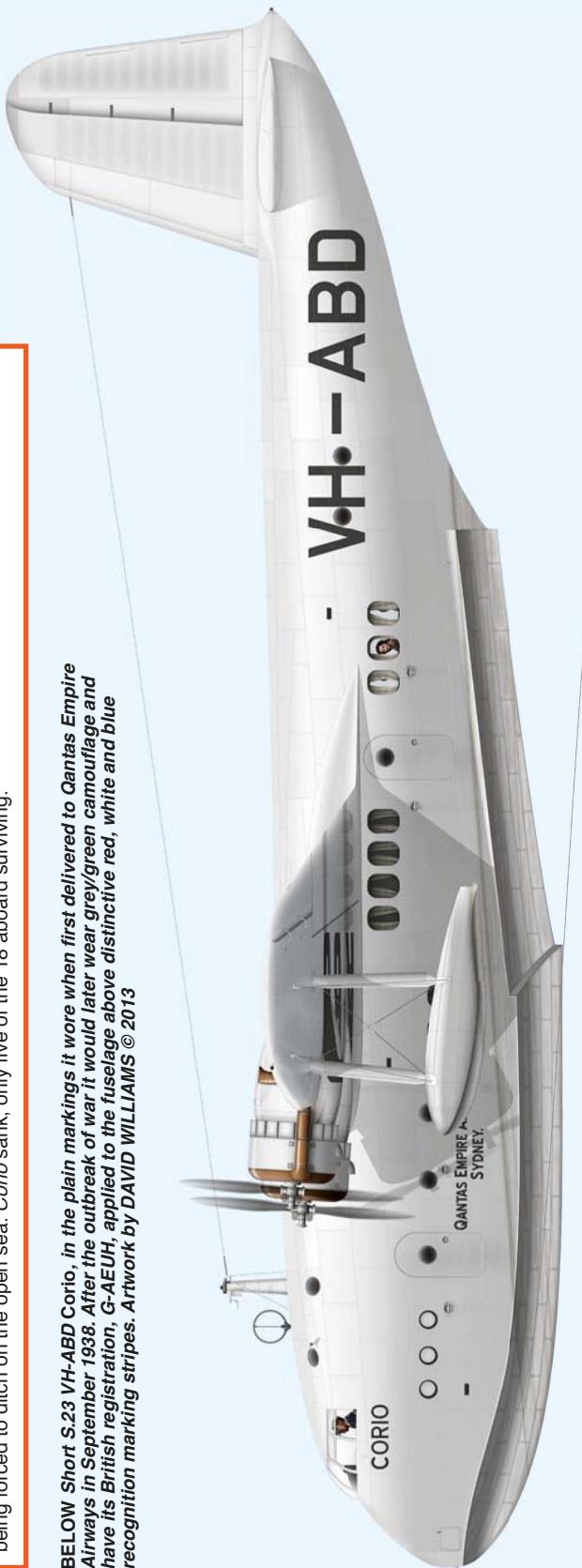
SHORT S.23 EMPIRE Flying Boat VH-ABD, c/n S.850, named *Corio*, was the second, in production order, of the six original Empire flying-boats allocated to Qantas Empire Airways (QEAs). It was the fourth to be delivered to Imperial Airways Ltd (IAL) on behalf of QEAs, in February 1938. When the Australian Department of Civil Aviation rejected Australian registration on the grounds that *Corio* would not actually be operating in Australia for some months, it was re-registered in the UK as G-AEUH. Contrary to international regulations, however, it continued to wear its factory-applied Australian registration marks.

Corio was eventually delivered to Australia, operating commercial service SE16, in September 1938. Following inspection in Australia and completion of the required paperwork, it was registered as VH-ABD on October 3 that year, the last of the QEAs flying-boats to be put on the Australian civil register. On the outbreak of war, the Royal Australian Air Force (RAAF) chartered two IAL Empire flying-boats which happened to be in Sydney at the time. In return *Corio* and VH-ABE *Coorong* were transferred to IAL ownership, *Corio* being re-registered in the UK with its original British registration, G-AEUH. The aircraft continued to operate Empire Air Services to Australia, after June 1940 on the "Horseshoe Route" from South Africa.

On Friday, January 30, 1942, *Corio* set out from Darwin operating "Extra" service XWS160 under command of QEAs Captain Aubrey Koch. It was bound for Koepang, on Timor, and thence Sourabaya to evacuate women and children ahead of the Japanese advance. The flying-boat was approaching the Timor coast when it came under sustained attack from Japanese fighters, eventually being forced to ditch on the open sea. *Corio* sank, only five of the 18 aboard surviving.



BELOW Short S.23 VH-ABD *Corio*, in the plain markings it wore when first delivered to Qantas Empire Airways in September 1938. After the outbreak of war it would later wear grey/green camouflage and have its British registration, G-AEUH, applied to the fuselage above distinctive red, white and blue recognition marking stripes. Artwork by DAVID WILLIAMS © 2013



RIGHT Qantas Empire Airways promoted tourism to the many glamorous and remote destinations on its route. This advertisement from 1939 uses an Empire flying-boat in the context of local colour to encourage Australians to sample the exotic delights of Java.

Qantas's Agent in Batavia, W.M. "Shinty" Colvill, to come quickly with a long length of 3in (75mm) manila rope to secure the flying-boat.

Going ashore

Eventually a prau paddled out, but, to Tapp's alarm, tied up to the anchor rope. Following a bout of screaming and shouting from the flying-boat, the paddler let go and, as the current carried him alongside, he was grabbed and made fast. As it was vital to contact Colvill, Flight Steward D.F. "Paddy" O'Brien volunteered to go ashore. After an eventful journey, dodging snakes and slipping into the river, he was able to telephone for help.

Shinty Colvill arrived at about 1600hr with the rope. He was quickly taken out to *Corio* by prau. "He had no sooner got one hand on to the passenger entrance hatch," recalled Tapp, "... when the sampan wallah, for some unknown reason, stuck his paddle into the water . . . this immediately swung the tail of the [prau] away from the flying-boat, and allowed it to drift backwards so that Shinty was gradually becoming like the proverbial punter whose pole is stuck in the bottom of the river, and within seconds he fell in". Luckily, Colvill grabbed the sill of the doorway as he fell and was quickly hauled aboard *Corio*. "Colvill can speak fluently in Scotch, Australian, Dutch and Indonesian. He spoke all four with considerable force at the sampan wallah, who by this time was somewhere near the bank again". Sopping wet and covered in leeches, Colvill quickly stripped off, removed the leeches and put on oddments of dry clothing that the flying-boat crew provided.

As soon as Tapp explained what was needed, Colvill called the prau over. Taking the rope to the bank, they slowly hauled the flying-boat against the river's edge, where it was secured for the night



with extra rope brought by Colvill's clerk, Wee Sim. In the morning, the weather having cleared, one end of the rope was ferried to the opposite bank and with about 200 locals on each end of the rope the aircraft was once again hauled into the centre of the river. With the big flying-boat being held steady by the local manpower, Tapp started the engines, slipped the rope, opened the throttles and took off for the short hop to Tandjong Priok.

Flexibility and vulnerability

This was not the end of their problems, however. After refuelling at Batavia, *Corio* departed for Singapore but weather forced it to stop short at Klabat Bay on Bangka Island, where it endured another day's delay before reaching Singapore.

Corio on the step while in service with QEA before the war. In January 1942 the aircraft would be attacked by Japanese Navy Mitsubishi Zeroes during a flight from Darwin to Koepang on Timor.

CAPTAIN ERIC SIMS COLLECTION VIA AUTHOR





Corio on final approach along the Norman River to alight at Karumba in Queensland, before the war. August 1938 saw the inauguration of Stage 3 of the Empire Air Mail Scheme with the departure of service SW1 ("Sydney Westbound"), which brought Australia into the Scheme.

"With the big flying-boat being held steady by the local manpower, Tapp started the engines, slipped the rope and opened the throttles . . ."

The episode demonstrated the flying-boat's flexibility to alight if necessary on any suitable stretch of water, of which there were many along the route. The Empire 'boats were particularly good in this respect as they had sound sea-keeping qualities and could operate in quite rough conditions. With instrument approaches as we know them today non-existent, a landplane in a similar predicament (as Qantas had found on occasion during the de Havilland D.H.86 days) would be forced to make a dangerous blind approach to a land aerodrome surrounded by various obstacles or try an off-aerodrome forced landing, which would almost certainly result in damage to the aircraft. On the other hand the helplessness and vulnerability of the flying-boat once on the water was also clear

and it was only by great good fortune that Tapp avoided any kind of damage to the aircraft.

In retrospect, flying-boats have been judged an evolutionary dead-end in aviation. For the EAMS, the costs of establishing and operating flying-boat bases in support of these charismatic aircraft proved far higher than anticipated and the logistical difficulties of marine operations meant considerable inefficiency compared with landplane services. However, as the story of *Corio*'s alighting on the Tjitarum River shows, very occasionally flying-boats did have their advantages.



ACKNOWLEDGMENTS: The author would like to thank the Qantas Heritage Collection and David Williams for their help with this article

SHORT S.23 EMPIRE FLYING BOAT DATA

Powerplant 4 x 920 h.p. Bristol Pegasus XC nine-cylinder single-row air-cooled radial piston engines driving three-bladed de Havilland variable-pitch propellers

Dimensions

Span	114ft 0in	(34.75m)
Length	88ft 0in	(26.82m)
Height	31ft 9¾in	(9.7m)
Wing area	1,500ft ²	(139m ²)
Max hull beam	10ft 0in	(3.05m)

Weights

Empty	23,500lb	(10,660kg)
Maximum	40,500lb*	(18,370kg)

Performance

Maximum speed	200 m.p.h.	(322km/h)
Cruise speed	165 m.p.h.	(265km/h)
Stalling speed, full flaps	75 m.p.h.	(120km/h)
Min alighting speed	68 m.p.h.	(109km/h)
Initial climb	950ft/min	(290m/min)
Service ceiling	20,000ft	(6,100m)
Normal range	760 miles	(1,220km)

*Later 43,500lb (19,730kg)

Sopwith Pup B1807, marked as "A7", while serving with No 76 (Home Defence) Sqn at Copmanthorpe, Yorkshire, where the unit was engaged on anti-Zeppelin duties.



BEFORE & AFTER

ROGER TISDALE and ARVO VERCAMER trace the history of a Sopwith Pup that swapped its uniform for civvies after the Great War — and which still exists

SOPWITH PUP B1807 was one of 150 built by the Standard Motor Co Ltd at Coventry during the spring of 1917. Finished in PC10 and fitted with a 100 h.p. Gnome Monosoupape, it was allocated to No 112 (Home Defence) Sqn at Throwley, Kent, from where it flew at least two patrols against German Gotha bombers during August 1917.

It was then issued to No 76 (HD) Sqn, based at Copmanthorpe, where it was coded A7 before being transferred to No 198 (Night Training) Sqn at Rochford, Essex. It passed through East Retford in Nottinghamshire some time after July 1918, photographs showing it fitted with a headrest and an 80 h.p. le Rhône in a revised cowling. The finish appears to have been Nivo (Night Invisible Varnish, Orfordness), complete with nightfighter roundels, with the number 1807 marked under

the wings. By the time the armistice was signed in November it was serving with No 39 Sqn.

By mid-August 1919 B1807 had been put up for sale by the Aircraft Disposal Co, with which it was registered G-EAVX. In 1920 it was acquired by Fg Off (later Wg Cdr) Aubrey R.M. Rickards, who had it modified while serving at RAF Andover.

Following an aborted attempt to fly to Norway, G-EAVX appeared at the Aerial Derby at Hendon in July 1921. Although the aircraft had no Certificate of Airworthiness it was flown by Capt Dring Forestier-Walker, who crashed it while racing on the 16th. The aircraft was written off and the parts were stored in the Grahame-White hangars at Hendon until they were disposed of in 1924. Nearly 50 years later they were found in an old barn in Dorset, and the Pup is currently under restoration to airworthy status.



LEFT The Pup in its new predominantly blue-and-red civil colour scheme, and wearing the registration G-EAVX. Following its crash during a race at the Hendon Aerial Derby on Saturday July 16, 1921, the Pup was stored on site until it was disposed of in 1924. In 1972 its current owner, Kelvyn Baker, discovered the remains of the fuselage in a barn in Dorset, and set to work restoring it. The restoration of the sole surviving Standard-built Pup to airworthy condition, at Baker's workshop near Weston-super-Mare, is ongoing, the wings and le Rhône rotary engine having been fitted.

BELOW Standard Motors-built Sopwith Pup B1807 finished in PC10 while serving with No 36 (HD) Sqn during 1917-18

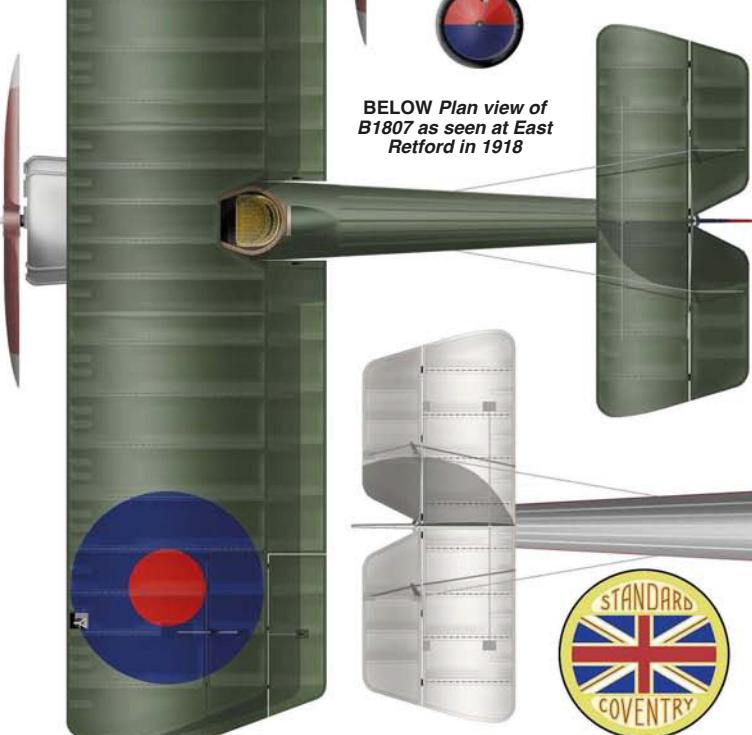


Cowling detail of the Gnome Monosoupape engine. Note the added asymmetrical cooling vents

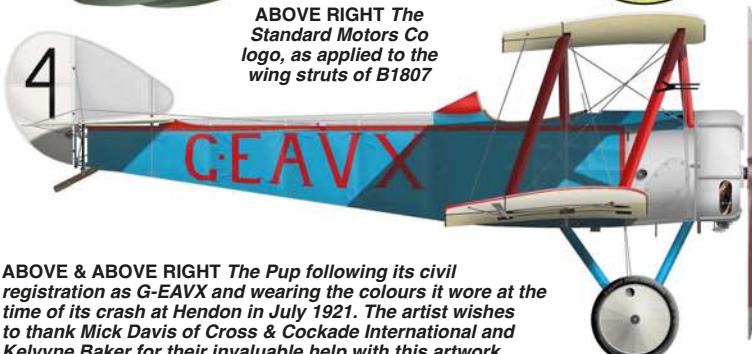


ABOVE Pup B1807 with Nivo fuselage and nightfighter roundels as worn when operating at East Retford

BELOW Plan view of B1807 as seen at East Retford in 1918



ABOVE RIGHT The Standard Motors Co logo, as applied to the wing struts of B1807



ABOVE & ABOVE RIGHT The Pup following its civil registration as G-EAVX and wearing the colours it wore at the time of its crash at Hendon in July 1921. The artist wishes to thank Mick Davis of Cross & Cockade International and Kelvynne Baker for their invaluable help with this artwork



Arvo@arvoart.com



"The Pig" — Piaggio P.166M 9L-LAF, c/n 406, undergoing maintenance at its base at Yengema, Sierra Leone, in 1966. The unconventional gull-winged utility aircraft of pusher configuration was a development of the same company's P.136 amphibian, the prototype P.166 making its first flight in November 1957.

ALL PHOTOGRAPHS VIA AUTHOR UNLESS OTHERWISE NOTED



WEST AFRICA WINS AGAIN

... or pigs can fly

*In December 1965 commercial pilot **ED WILD** was looking out over a typically dismal British winter scene when his chief pilot offered him a three-month job in Sierra Leone flying the unusual gull-winged Piaggio P.166 to remote diamond mines "up-country". It was hot, humid and sometimes hairy, but always memorable, as he explains . . .*

■ WAS CONTEMPLATING the grey December drizzle drifting across the airfield when the crewroom door opened: "How would you like a few months in the tropics?" The chief pilot, John Hutchinson, with his boyish good looks and ready smile, was grinning. I suspected a hoax.

In 1965 I was flying for McAlpine Aviation at Luton, Bedfordshire, when I was asked to go on a three-month assignment to West Africa. McAlpine had sold a Piaggio P.166 aircraft to a diamond-mine operator in Sierra Leone some time previously, and continued to provide technical and other support. The customer now needed a pilot urgently. I had considerable "previous" as a pilot in Africa, and the prospect of escaping the UK winter weather for three months was a welcome one.

On December 23, 1965, my wife and I flew on a British Caledonian Bristol Britannia to Freetown, the capital of Sierra Leone, overnighting there before taking a Sierra Leone Airways de Havilland Heron up-country to the principal mine at Yengema, a flight of more than an hour above dense tropical rainforest. On arrival we were greeted with puzzling enthusiasm. Unbeknown to me the resident pilot had inadvertently landed the Piaggio with its wheels up some months earlier. This swiftly led to his departure and to lengthy repairs to the aircraft, undertaken by a team from Piaggio.

During this period the mine staff — mainly expats from the UK and their families — having become used to the convenience of the company aircraft, had been deprived of their main link to Freetown and the outside world, hence the welcome. Repairs to the aircraft had been completed some time before my arrival, and as surface transport from Freetown was a long road journey over difficult terrain with rivers to ford, the management was anxious to put its own aircraft in the air again.

We found ourselves in a tropical paradise, with landscaped bungalows surrounding a golf course, a club house with a restaurant and a large swimming pool. The company's resident aircraft engineer, Tony Francis, was also pleased to see me. Since overseeing the repairs, he had been kicking his heels awaiting the arrival of a "driver, airframe" and was anxious to be operational again. A pleasant individual, he showed me around the aircraft with some pride, which I saw as a good starting point in our relationship. The aircraft was a Piaggio P.166, registration 9L-LAF (known affectionately as "The Pig"), fitted with Lycoming engines.

Christmas greetings

In view of the warm welcome, and of the operational difficulties arising from the lack of availability of the Pig, I felt it important to get the show moving without delay, starting with a

comprehensive inspection and test flight after the lengthy repair work. Tony enthusiastically accompanied me on the flight (it is not always easy to get engineers to "volunteer" for post-overhaul flights).

On Christmas Day 1965 we completed the test flight without problems. At Tony's suggestion, we flew on to the sister mine at Tongo some 35 miles to the south, the residents of which had been hit particularly hard by the loss of the aircraft. It was a first look at the local area for me and I was surprised at the extent of the huge workings — some 240 square miles (620km²) — that had grown around this operation in the 20-odd years since the discovery of diamonds. We flew around both mines at low level and received welcoming waves (at least I think they were; the Pig was a noisy beast for those on the ground) from staff and families pleased to see the aircraft back in service.

The daily flying routine involved transferring workers and their families between Freetown and the mines, bringing essential supplies and spares back, carrying diamond shipments to Freetown and seeking out the IDMs — illegal diamond miners — who were ubiquitous.

The operation was completely self-contained and everything needed was in place at Yengema with the exception of aviation charts for the region — something of a disadvantage in an area with few and unreliable navigation aids. This had apparently not been an issue for the previous pilot, as he had been flying in the country for a number of years and was probably

aware of every hill and bend in the rivers. The only chart available was based on a document produced by the local Catholic Fathers, who had surveyed the area from hilltop and river. It was dated 1911. Near the mine the headstones engraved "Died 19**, Malaria" reminded me that this was the "White Man's Grave".

Satellite navigation was just a distant gleam in 1965 of course, so navigation was by compass and stopwatch, and with the help of the mine's survey department I was able to obtain accurate tracks and distances between the main airfields. After this the work quickly settled into a routine which involved several daily flights between the company mines at Yengema and Tongo, and Lungi International and Hastings near the capital, Freetown. There were also occasional sorties to less-frequently-visited spots.

Surrounded entirely by dense rainforest, there was a hangar with resident engineer, a substantial spares inventory, a paved 2,950ft (900m) runway at Yengema and a large stock of aviation fuel — sheer luxury for a single-aircraft African bush outfit. The shorter airstrip at Tongo had a rolled laterite (clay) surface that led to poor braking action in the wet season and produced huge clouds of red dust during the rest of the year. The Pig coped with these operational issues with aplomb.

Move over 007

We carried mixed loads; company employees or spare parts travelling between the mines, or families returning to the UK and en route to

BELOW The author beside The Pig at Hastings Airfield, near Freetown, in 1966. The initials SLST on the forward fuselage beneath the cockpit window refer to the aircraft's operator, the Sierra Leone Selection Trust. McAlpine Aviation at Luton, for which the author was working, had been the official UK agent for Piaggio since May 1959.

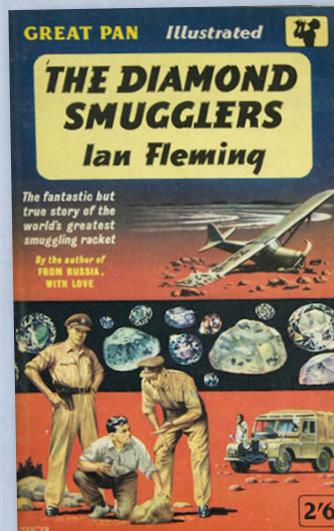


"Up-country" — the Sewa River is typical of the region's challenging terrain. This photograph, taken from one of the mining company's helicopters, shows a fish trap at bottom left. The fish enter the trap and are led directly to the cooking pots on the riverbank, where the locals gather to prepare their next meal.



Freetown connecting with a flight. About once a month a consignment of uncut diamonds was sent to Freetown to be air-freighted to Gatwick, before onward transfer to Amsterdam or Brussels. These diamond flights were performed in true James Bond style. After getting any passengers settled and engines started I would complete the take-off checks, taxi on to the runway and come to a halt. At this point and with the engines idling, two large security men with a heavy Samsonite case in one hand and a Colt 45 in the other would appear from the long grass bordering the runway, run to the passenger door and leap aboard shouting "Go! Go! Go!" in finest Hollywood fashion. Accelerating down the runway I was aware of a forest of rifles. I hoped they weren't loaded.

This heightened security resulted from an earlier incident when, having landed at Hastings, near Freetown, the consignment was hijacked by an armed gang, which got away with a small fortune in uncut stones. A government minister was rumoured to have plotted the whole thing. In that instance the lone and elderly guard fired the only shot of the whole affair, promptly blowing off his own toe with his old Lee Enfield 0.303in. James Bond author Ian Fleming spent several weeks at Yengema gathering material for his 1956 book *Diamonds Are Forever* — there was no shortage of material. [Fleming also wrote a non-fiction book,



The Diamond Smugglers, about his experiences in Sierra Leone, published the following year — Ed.]

The good life

Life on the mine was pleasant for those with time on their hands. A swimming pool, golf course and library were provided, complete with clubhouse and fully-stocked bar. There was also a company store for the purchase of groceries and provisions etc and a small well-equipped hospital providing reassurance in the event of health problems. On Sunday evenings a film was shown in the clubhouse, usually a Hollywood potboiler, and for a few weeks a tablecloth was used

as a temporary screen, complete with jam stains. All of these benefits were paid for by the sale of gold, which had to be sold to the government as the company had no gold-mining concession.

The local township of Koidu was interesting, being the base of many of the IDMs in the region. It had all the transient appearance of a Wild West goldrush town, complete with bars, prostitutes, and most unlikely of all in this rainforest setting, a scattering of brand-new Mercedes cars.

By 1970 illegal diamond-mining was increasing and security flights became more frequent at the mines. Several operations were launched involving the company's helicopters and the newly arrived de Havilland Heron — another type I had previously flown extensively — together with mine security plus large ground



Taxying in with inboard engines stopped is Sierra Leone Airways de Havilland D.H.114 Heron 9L-LAD, one of two ultimately operated by the airline. In the foreground is one of a pair of Bell 47G helicopters operated in Sierra Leone by Autair, and behind that is the Beech H18, with tricycle undercarriage, operated by De Beers from the city of Bo, 155 miles (250km) south-east of Freetown.



ABOVE The Pig heading south-east down the coast from Lungi Airport to Hastings for a night-stop in Freetown. In December 1968 the aircraft was put on the British civil register as G-AWWJ, but was cancelled five months later to be put on the Swiss register. It was then sold in February 1970 to a new owner in Nigeria, where it became 5N-ADP.

forces of the Sierra Leone Army. The exercises were largely ineffective, as, unlike the aircraft involved, ground elements lacked the means to communicate. In one instance I flew low in order to bring a group of IDM's to the attention of security, who were very close but unsighted. On my second low pass I thought that I had flown into a swarm of locust, and it took a moment to realise that what I was hearing was gunfire striking the airframe. The shooting had come from IDM's, who, although often armed, were on this occasion using only shotguns. Apart from superficial damage, no harm was done.

Local enterprises arose from the mining industry, and a drive through villages outside the camp in my company Volkswagen Beetle brought streetwise youngsters of eight or nine

scampering from the bush holding up small diamonds between thumb and forefinger hoping for a sale, but possession of diamonds was strictly forbidden.

The tropical weather in this part of Africa was mostly benign and had a settled pattern. My favourite time was the cool early morning, when strands of mist hanging in the trees gave a dramatic effect, and the earth smelled fresh. However, the rainy season, which normally started in May, could be relied upon to provide some uncomfortable moments. On one occasion I was asked to go to the mine at Tongo in order to pick up a badly injured IDM who had been shot in a violent dispute over a large diamond he had uncovered. He was not expected to last the night. The doctor there wanted to have him





LEFT A map of Sierra Leone showing the mining concessions, in orange, of the Sierra Leone Selection Trust (SLST) and the main airfields that made up the points in *The Pig's* daily routine. Map by MAGGIE NELSON.

OPPOSITE PAGE A remarkable photograph from one of the Autair Bell 47s showing licensed diamond miners hard at work in the region's distinctive yellow-brown lateritic soil. Although largely working the old-fashioned way, these miners had some modern aids like pump equipment.

INSET BELOW Ferry pilot Janet Ferguson at Gatwick just before departing for Australia in a Beagle 206 for the Royal Flying Doctor Service in 1967. Ferguson, a member of the Tiger Club, was a resourceful and highly skilled pilot and a frequent participant on the 1960s UK air-racing circuit.

flown to a hospital in Freetown. I flew the Pig down to Tonga and, as the route was familiar to me by now, had no trouble locating the strip. Appearing suddenly, a Land Rover skidded to a halt at the aircraft and I was told that the doctor wanted to talk to me. In the pouring rain I was taken to the hospital where, while steaming gently, and with my shirt clinging to me, I peered through the small window in the operating theatre door, expecting him to come out. Instead he vigorously waved me inside, and pointed with his scalpel to a large wound in the man's chest. "Need to get him to hospital soon or he won't last," he said. With a nurse to accompany him we loaded the patient on to a stretcher secured to the floor of the aircraft. I departed for Freetown, making an instrument approach at Lungi before breaking off to fly VFR (visual flight rules) a few miles down the coast to Hastings — near the remains of the old Imperial Airways flying-boat slipways — which served as a commuter airfield for Freetown.

Meeting an old friend

Occasionally I had to overnight in Freetown, a big, bustling, noisy and smelly city, which staggered down to the very edge of the sea. Youngsters plucked at sleeves and pickpockets

did good trade. In the late 1960s it was still very much as Graham Greene described in his classic 1948 book *The Heart of the Matter*. The 20min drive from Hastings into Freetown was a winding bush road with rusting hulks of crashed vehicles. "Mammy Wagons" were a feature of West Africa and much of the undeveloped world, and carried every conceivable form of cargo from humans to goods. They were covered with slogans and paintings, many with a religious theme: "God is good", "Jesus loves you" and, rather ominously, "Time wait for no man". They were always in a hurry and it was wise to give them plenty of room.

On one occasion I was staying at the Rest House at Lungi Airport when I saw a familiar face, the late Janet Ferguson, a former colleague from my instructing days. While we breakfasted together she told me that she had been ferrying a new Scottish Aviation Bulldog to Nigeria via the coast route the previous day, when a collision with a large bird occurred and Janet had diverted into Lungi. She volunteered to show me the aircraft. The Bulldog was a sorry sight; apart from severe damage to the wing leading edge, the entire wing was visibly bent back several inches. Janet wisely decided to leave the aircraft at Lungi and position back to







ABOVE The helicopter's unique abilities were of great use in Sierra Leone, serviceable runways being comparatively few and far between. Here the author's wife and son enjoy a local flight in one of the Bell 47Gs, with Autair's Franz Astner at the controls.

the UK to pick up the next Bulldog that was awaiting ferry.

Her exploits have gone largely unnoticed in the UK, but Janet's calm acceptance of her situation and her gentle enthusiasm to get back for the next delivery was typical of her approach. She was a kind, thoughtful person with amazing reserves. Never one to push herself forward, her reticence hid great inner strength and enviable piloting ability and judgement.

Her flying logbook is fascinating and might make eye-watering reading for some of today's ferry pilots. Apart from many transatlantic flights Janet also ferried Bristol Freighters from the UK to New Zealand — solo!

Another coup

I seemed to run into violent unrest on many of my trips to Africa. In 1967 we were back at the mine and, sitting on the balcony with a few friends one evening, were surprised by the sudden appearance of three heavily-armed locals in the garden. We quickly realised that this was not a robbery but something different. It transpired that there had been a military coup in Freetown that day and these three were part of the advance guard that was intended to take over the mine. It was all rather low-key, in fact they were quite diffident and almost apologetic. The arrival of mine security effectively ended the drama peacefully.

The De Beers mining company operated a Beech 18 from Bo airfield in support of its own



TAH ARCHIVE

ABOVE Piaggio P.166 G-ARUJ, operated by Charrington Breweries, outside the McAlpine Aviation hangar at Luton, where the company provided maintenance services for the type. The underrated P.166 offered superb short-field performance, being able to take off with a full load of passengers and fuel from a 600yd (550m) grass strip.



ABOVE The office — the cockpit of P.166 G-APWY, operated by McAlpine on behalf of Marconi's aeronautical division. Contemporary flight reports on the type are unanimously positive, James Hay Stevens describing it in a May 1959 article in Flight as "lively but docile", another report referring to it as "handsome and highly efficient".

mining operation, and occasionally mutual support was provided whenever one or other of the aircraft was unserviceable. On one occasion I was asked to pick up a shipment of diamonds and deliver them to Freetown. Arriving at Bo after breakfast I found the little grass airfield deserted at this early hour. Killing time with another half-hearted walkaround inspection, the "squeak, squeak" of something in need of oil set my teeth on edge. A local appeared, dressed in an old King's West African Rifles uniform, complete with a row of medal ribbons, but lacking any footwear. He put his bicycle down, saluted smartly and handed me a large wash-leather bag tied neatly at the neck with a leather thong. This was the diamond shipment! I chatted briefly with this old soldier before he raised another salute and creaked away into the bush. I tucked the heavy bag under my seat before continuing thoughtfully on to Freetown.

After returning to the UK from my first visit I was offered a job with Britannia Airways, which operated holiday charters to the Mediterranean, a mainly summer occupation at the time. In common with all UK charter airlines there was a shortage of winter work; long-haul holidays and skiing trips were still in the future. Britannia agreed when I requested a spell of unpaid leave to return to Sierra Leone during the subsequent winters as a relief pilot for the Pig. This winter arrangement continued for several years, together with ferry flights to and from the UK. By 1974, however, the increase in winter work with Britannia Airways was making it difficult to

obtain unpaid leave. In the event it was not to be farewell for good, as I found myself back in Africa in later years.

"Wawa!"

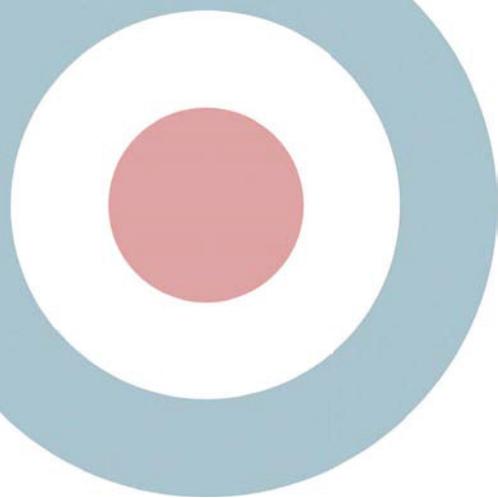
I spent some interesting and happy days in Sierra Leone, but remember the frequent cry of "wawa" when things went wrong; the spares didn't arrive or some other calamity overtook events. The cry was really a verbal acceptance of forces beyond the control of mortals, a symbolic shrug of the shoulders. What did "wawa" mean? "West Africa Wins Again". It usually did.

The presence of the vast diamond fields with their alluvial harvest should have meant security and good living standards for the indigenous population. But, as in other places, a source of huge wealth in such a poor country has been a disaster, with atrocities and death for many in the country in the 1990s — but great wealth for a few major companies and other influential figures. Many millions of carats of stones have been mined in the country, but little of this has benefited the population. The country would have been a better place without diamonds.

Years later, I came to realise that our earlier visits had taken place at what was a more innocent time altogether, compared to the horrors that were to follow in Sierra Leone with the so-called "blood diamonds".

I'm still flying Diamonds — but these are light aircraft manufactured in Austria and operate from the somewhat less tropical environs of Shoreham on England's south coast.





In 1959 a trio of Avro Vulcans of No 617 Sqn set off on a tour which was to set a new world circumnavigation record and fly the flag for the capabilities of the Cold War RAF. An important part of the trip was to make an impression at the opening of the new airport in the New Zealand capital, Wellington. An impression was certainly made — but not quite the one intended, as JONATHAN POTE relates

WELLINGTON, ALTHOUGH the capital of New Zealand (and both the most southerly and most remote capital city in the world), is dwarfed by Auckland. A major reason for this is the former's cramped topography, set around a flooded volcanic depression open to the Cook Strait. The steep terrain (and the strong, turbulent winds of the Strait) meant that until the late 1950s there was no international airport. To rectify that, a hill of four million cubic yards surmounted by nearly 200 houses was levelled, clearing the northern approach while providing rock for the runway extension into the sea. The opening of Wellington International Airport on Sunday, October 25, 1959, was thus planned to be a memorable occasion. At last the capital would have something more than a small landing ground and passengers need no longer suffer the two-hour drive from Paraparaumu, itself only served by internal air services. The airport would be a huge economic boost to the city.

Memorable it was, but not in the way its organisers intended. Lockheed Lodestar ZK-BVE top-dressing the new runway was the least of the spectacles; when the day was over, a Royal New Zealand Air Force (RNZAF) Short Sunderland



Still looking futuristic more than six decades after the type's first flight, three Vulcans of the first B.1 production batch formate in line astern in their distinctive all-over anti-nuclear-flash white markings. The Vulcan B.1 entered frontline RAF service with No 83 Sqn at Waddington in May 1957.

TAH ARCHIVE

A CLOSE SHAVE AT WELLINGTON





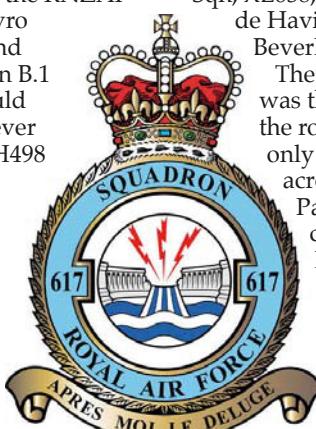
TAH ARCHIVE

ABOVE A magnificent Avro photograph of the first production Vulcan B.2, XH533, showing its supremely elegant delta form above the clouds. The B.2 introduced a modified wing with an extended and cambered leading edge, which improved handling and performance at altitude, and the more powerful Olympus Series 200 powerplant.

(NZ413/"M") lay hurriedly beached at Hobsonville, near Auckland, awaiting major repairs after splitting its hull as it scraped the runway. It was not the only aircraft to strike the runway dangerously, as, at Ohakea, the RNZAF base well north of Wellington, an Avro Vulcan lay slewed off the runway and would not fly again that year. Vulcan B.1 XH498 had nearly caused what would have been New Zealand's greatest ever loss of life. The navigator aboard XH498 that fateful day was Wg Cdr Bryn Lewis, who returned to New Zealand recently after more than 50 years to tell his story at Ohakea.

THINKING GLOBAL

In 1958 the Government of New Zealand requested the British Government to instruct the RAF to attend the opening of Wellington International Airport the following year. The RAF in turn saw a great opportunity to perform the Service's first world circumnavigation, gaining much operational knowledge and favourable publicity in the process. The task was given to No 1 Group, RAF Bomber Command, to organise, and No 617 Sqn — the famous "Dambusters" — was selected to undertake it. As the squadron's



leading navigator, Bryn Lewis settled down to plan the epic flight for three Vulcans. Engineering support was to be provided by groundcrew flying in a Bristol Britannia of No 99 Sqn, XL638, *Sirius*, itself a new type in service. A de Havilland Comet C.2 and a Blackburn Beverley also joined the detachment.

The RAF station at Akrotiri on Cyprus was the obvious first nightstop, but then the route planning became difficult. The only available route in the late 1950s lay across Turkey and Persia to Karachi in Pakistan. Fine, except that this passed close to the Soviet border, and it was known that the Russians had an "evil twin" of the Turkish beacon at Van, intended deliberately to lure Western aircraft north into Soviet territory where they could be forced down for intelligence gathering. The Russian beacon, situated at Yerevan in Armenia,

transmitted on the same frequency as the Turkish beacon at Van but with greater power and in 1958 lured a USAF Lockheed C-130A Hercules on an electronic eavesdropping mission across the border. The Hercules was shot down by Soviet MiG-17s.

In April 1959, just six months before the Vulcans' flight, Avro Super Trader G-AGRH,

WING COMMANDER BRYN LEWIS

AS A TEENAGER Bryn Lewis became a civilian meteorological observer attached to the RAF during the Second World War, and was thus debarred from call-up. In late 1942, however, the RAF began recruiting its own Met observers and Bryn was among the first of only 180 men ever awarded the "M" brevet of Meteorological Air Observers. He flew with No 521 Sqn from Bircham Newton and Docking in Norfolk in obsolescent Handley Page Hampdens and later in Lockheed Hudsons and Venturas. Moving to No 519 Sqn (Hudsons and Venturas), based at RAF Wick in northern Scotland, Bryn flew on *Recipe* sorties that headed north beyond the Arctic circle to sample the polar front at both low and high altitude.

He then transferred to No 518 Sqn, flying Handley Page Halifaxes out of Tiree in the Hebrides in 1945 (when the photograph, **INSET RIGHT**, was taken). These aircraft ranged as far out into the Atlantic as fuel allowed (700 nautical miles – 1,300km – with minimal reserves) and a change of wind direction could leave them in mortal danger. The Halifaxes flew fully armed with depth charges to be able to attack U-boats sighted by chance but Bryn never saw the human enemy in his 800hr Coastal Command tour. He met a more dangerous foe, the weather, daily. On June 3, 1944, it was the meteorological observations of 518 Sqn that predicted the storm of June 5, and the improvement expected on June 6. Meteorologist Gp Capt Stagg recommended to Gen Eisenhower that Operation *Overlord* – the D-Day landings – be delayed by 24hr, thus changing almost certain failure into hard-won success and defining the course of history.

After the war, in a twist that only the RAF could manage, Bryn was commissioned as an accounting officer, but was promptly retrained as a navigator. He was posted to RAF Kinloss and the Coastal Command Avro Lancasters of No 120 Sqn, soon seeing the Avro Shackleton into service. In one interlude he was back on the Halifax again, flying Met.6s out of Gibraltar with No 202 (Meteorological) Sqn, which had been formed with the renumbering of 518 Sqn after the war. Post-war Met observers had unique terms of service; being already fully trained for their role, they joined as aircrew for two years, with an option for two further years' service, being guaranteed continued employment with the Meteorological Service as civilians thereafter. Again the mysterious ways of the RAF decreed that as an experienced "low-and-slow" maritime navigator, Bryn should be sent to the high-and-fast V-bomber force, despite needing a year's retraining in English Electric Canberras, during which the now Sqn Ldr Bryn Lewis was deputy officer-commanding No 12 Sqn. Finally inducted into the Vulcan force, he was made navigator leader of 617 Sqn – the famous "Dambusters".

JP



Zephyr, may have been similarly misled, as recounted by Roger Carvell in his feature *Ill Wind* in *TAH2*. The Super Trader crashed on Mount Süphan, a 13,000ft (4,000m)-high Turkish peak, while headed for the Soviet border. There followed an almighty rush by an RAF Mountain Rescue team from Cyprus to reach the wreckage, not primarily to recover the dozen bodies but because *Zephyr* was carrying highly secret missile components to the range at Woomera in Australia. These could not be allowed to fall into Soviet hands. A route via Aden and Gan in the Maldives would seem to have been far safer, but Bryn was not given reasons, just instructions.

On board with him in the lead aircraft, XH498, would be Air Vice-Marshal John Davis, Air

Officer Commanding (AOC) No 1 Group. What a prize an intact (or even crashed) Vulcan and a very high-ranking officer, fully briefed on Nato war plans, would have been for the Soviets.

THE TOUR BEGINS

On October 14, 1959, four Vulcans of No 617 Sqn departed from the unit's base at Scampton between 1150hr and 1250hr. They were XH498, commanded by Sqn Ldr A.A. Smailes; XH499 (Sqn Ldr D.B. Hamley); XH502 (Flt Lt L.G. Lunn) and XH483 (Flt Lt R.S. Trigg). The latter was not part of the antipodean adventure but was taking part in a *Profiteer* detachment to Malaya, in which aircraft from UK-based units were sent to reinforce local units for *Firedog* operations

Vulcan B.1 XH498 was one of 20 built in the second production batch, delivered between January 1958 and April 1959, and was one of the three sent on No 617 Sqn's circumnavigation tour in 1959. It was also the one that came to grief during the Wellington Airport opening ceremony.

ALAN TODD COLLECTION VIA LEE HOWARD





LEFT Air Vice-Marshal John Davis, AOC No 1 Group, is greeted beside XH498 on arrival at RNZAF Ohakea on October 19, 1959. Note the two-star pennant and 617 Sqn badge on the fuselage of the Vulcan. Also part of the retinue was AOC-in-C Transport Command Sir Denis Barnett, who travelled in the Comet.

RIGHT With airbrakes deployed, a Vulcan engine testbed comes in to land at Filton. Big, noisy and hard to ignore, the big delta-winged V-bomber became synonymous with Britain's ability to project power during the Cold War era.

against communist terrorists. The big delta bombers flew singly, 20min apart, the last aircraft in the trail indeed seeing a pair of MiG-17s lurking in the distance across the Soviet/Turkish border.

Arrival in Karachi was not without incident. All pilots were ordered by the squadron commander to deploy braking parachutes on landing so as to reduce the demands on the brakes in the hot climate. Nevertheless, 10min after parking at Karachi, the wheelbrakes of XH483 caught fire as a result of a hydraulic leak. Fortunately, a crew member was able to insist that dry powder was used by the emergency vehicles; foam could have caused the ceramic brakes to explode, rupturing the wing tanks and causing a conflagration of all three aircraft. (The crippled aircraft was repaired and flew on to Butterworth in Malaya on October 19.)

The three remaining Vulcans departed Karachi for Butterworth on October 17, before heading on to Darwin, Australia, a place of which Bryn does not have fond memories — "wooden huts

on stilts, 90°F temperature and 100 per cent humidity" — but, on October 19, flying at 45,000ft (13,700m), they easily broke the Darwin—Ohakea record. Few aircraft (and no jets) had ever flown the route.

SHOWING THE FLAG

In the days leading up to the Wellington ceremony the three Vulcans — XH498, XH499 and XH502 — "showed the flag" as widely as possible the length and breadth of New Zealand. Bryn's aircraft flew down the Southern Alps and over Aoraki/Mt Cook before descending to display at 500ft (150m) over Invercargill at the very southern tip of South Island before flying up the east coast at low level. The other Vulcans covered the west coast of South Island and much of the North Island, being seen by many people.

As well as the RAF presence at Wellington, the USAF contributed two Hercules and a Boeing KB-50 refuelling a North American F-100 Super Sabre, a McDonnell F-101 Voodoo and a Douglas B-66 Destroyer, while the Royal Australian Air

ALAN TODD COLLECTION VIA LEE HOWARD

The Vulcans of No 617 Sqn, including XH498 and XH502, at the SBAC Display at Farnborough in September 1960. On each display day a four-aircraft V-Force scramble kickstarted the show, the Vulcans performing on the Tuesday and Saturday, Valiants and Victors doing the honours on the other days.





PHILIP JARRETT COLLECTION

Force sent several English Electric Canberras.

For the Wellington ceremony, the plan was for a "V" of three Vulcans to sweep majestically across the city, and for one to land. Sadly the weather had other ideas, and under low cloud just XH498 left Ohakea (although all three were seen over the city on practice days). The mighty jet completed two touch-and-goes before lining up for a landing on the 5,250ft (1,600m) runway, notorious for the turbulence on its final approach. Bryn was unstrapped and out of his seat. In the case of a repeat of the Karachi incident, he was to exit the cockpit immediately the aircraft halted, holding a powder fire-extinguisher to attack the first brake unit to burst into flames. Instead of the normal sound and feel of a positive landing, however, there was a very loud impact and the aircraft veered to port.

As with all Vulcan crew, Bryn was well aware of the Heathrow tragedy three years earlier. On October 1, 1956, Vulcan XA897, returning from Operation *Tasman* (a visit to New Zealand and Australia with Air Chief Marshal Harry

Broadhurst, AOC-in-C RAF Bomber Command on board), had attempted to land at Heathrow in very bad weather. The aircraft was too low on approach and impacted a cabbage patch half a mile short of the runway. The undercarriage was forced up into the wings, severing the control runs and rupturing the fuel tanks. The massive delta was now an unguided ballistic missile. The pilot, Sqn Ldr "Podge" Howard, ejected, and while the Air Chief Marshal bravely tried to control the stricken aircraft, his choice was stark. He could not save the others as they had no ejection seats; he could either die with them or save himself alone. He ejected late, the other five (there were two supernumerary persons aboard — a crew chief and an Avro representative) dying in the inferno.

CRUNCH!

In fact XH498 had struck the lip of Wellington's Runway 34 with both main undercarriage bogies. The port unit was forced back 45°, allowing the wingtip to drag on the runway. The





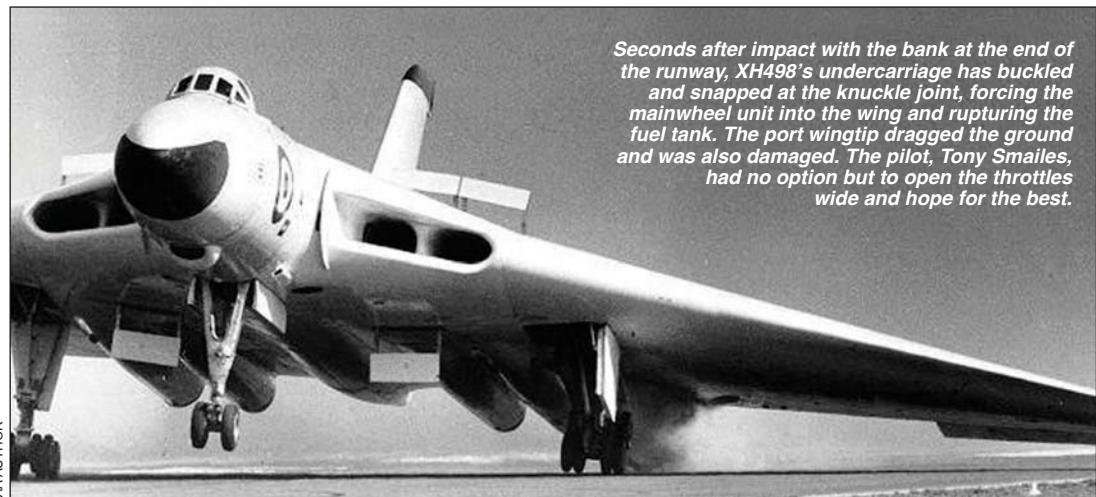
ABOVE Vulcan XH498 just about to clip the bank on final approach for its landing at Wellington Airport on October 25, 1959. Just visible on the bank beyond and to the left of the buses, beneath the Vulcan's port mainwheel bogie, is Peter Boyd, who had positioned himself to get some dramatic photographs to die for — very nearly literally.

damaged bogie also ruptured fuel lines within the undercarriage bay, fuel streaming out but mercifully not igniting ("or we would have beaten Concorde to it" as Bryn observes wryly).

In reply to a tense query from the pilot, Tony Smailes, air traffic control urgently replied "Go around, go around". Fortunately the four Bristol Olympus turbojets responded rapidly. As Bryn struggled to put his parachute back on and get strapped into his seat, he was relieved to see that the aircraft was responding to control inputs. The aircraft was not mortally wounded, but clearly badly damaged. Most significantly, the Vulcan was extremely low on fuel, partly

because the sortie had been undertaken with comparatively little fuel to ease the landing at Wellington, but also because of the leaks caused by the impact, which showered the crowd with kerosene, leaving a pungent smell in its wake, and because the undercarriage could not be retracted or fuel cross-fed to the unaffected starboard engines.

The Vulcan headed for RNZAF Ohakea and its longer runway, 80 miles (130km) away. The crew of the Transport Command Comet, witnessing the near-disaster from the VIP stand, scrambled in an attempt to give the Vulcan an airborne inspection and damage report, but were unable





ABOVE Wrong place at the right time? — one of Peter Boyd's remarkable photographs of XH498 coming in over the buses at the runway threshold, taken from the bank the massive bomber would hit moments later. Having moved his position slightly for the final touchdown, Peter avoided being hit by the mainwheels by a matter of inches.

to catch up. The Comet crew ignored a request by Wg Cdr Bower (OC 617 Sqn) to wait for him, but he passed an order for the Vulcan rear crew to bale out. This seemed perfectly sensible, as the pilots could then attempt a landing knowing that if things went awry, they could eject without leaving their compatriots to die. However, the undercarriage could not be retracted and thus the men would strike the nose leg as they exited the hatch into the slipstream under the cockpit.

Smailes respected their decision to stay, and, on finals into Runway 27 at Ohakea, jettisoned the cockpit canopy. This was standard procedure before firing the ejection seats but could be done as a separate operation, converting the aircraft to a "cabriolet" configuration — with a 140kt breeze on finals.

The touchdown at Ohakea, fuel virtually exhausted, was perfect. As the wings lost lift, the damaged wingtip touched and XH498 gently slewed to port on to the grass. All five occupants left via the open cockpit roof, running down the port wing. There was no fire. There were no recriminations from the AOC, who ordered the crew to fly the display at Ohakea's open day "to get back in the saddle". Thus the next day, in Vulcan XH502, they swept low in salute over their stricken mount.

A NARROW ESCAPE

Amazingly, viewed from today's culture of health and safety, Peter Boyd was crouched on the runway lip at Wellington, taking photographs of the mighty bomber's approach. After

the first two touch-and-goes he moved slightly to his left to get a perfect head-on view for the next approach. The main bogies impacted on either side of him, the powering-up Olympus engines showering him with gravel, the noise indescribable. Bill Howell, "Marshal One", driving a Vauxhall Zephyr, was immediately sent by air traffic control with an RAF engineering officer to the impact point. They noted that the port bogie had impacted 18in (46cm) below the lip (the starboard bogie just clipped the edge) and left a score-mark visible for years afterwards along the runway. Debris they collected included parts of the Maxaret brakes and wingtip navigation lights.

The Vulcan was categorised as Cat 4A and declared ROS (repairable on site) at Ohakea on January 4, 1960, and was allocated to Avro at Woodford, the paperwork being backdated to December 22, 1959. A team from Woodford was sent out to Ohakea, and repairs to XH498 had been completed by June 21, 1960, when the big V-bomber made a flight over Auckland, Wairoa and Wellington in the hands of Flt Lt C.R. Bell. It landed back at Scampton on June 24, having returned via a westabout route.

Had Smailes lost control at Wellington and not been able to get back into the air, the Vulcan would have veered to port towards the dragging wingtip and collided with the static display (which included the Comet, Britannia, Beverley, an RNZAF Handley Page Hastings, RAAF Canberras and two USAF Hercules), then the crowd. The resulting carnage does not bear thinking about.



ABOVE The stricken Vulcan roars away, streaming fuel and with the port mainwheel skewed 45° aft. In all the excitement, Smailes had forgotten to retract the airbrakes, which could have caused further problems . . .

BETWEEN . . . which thankfully did not materialise, Smailes skilfully manhandling the aircraft to the RNZAF base at Ohakea, where it landed safely but ran off the runway, leaving a sizeable gouge in the grass in its wake.

On October 31, 1959, the two remaining Vulcans headed on via night stops at Fiji and Christmas Island (then an RAF base) to Honolulu, Hawaii, where a somewhat "naughty" cargo of New Zealand salmon was smuggled from the bomb bay to a freezer overnight. The same happened at Travis Air Force Base near San Francisco the next day after a transit in which the Vulcans reached 55,000ft to clear cumulo-nimbus cloud. On November 7, as Bryn's aircraft, XH502, climbed out from Offutt Air Force Base, near Omaha, Nebraska, for the next leg to Goose Bay, Labrador, the crew heard XH499 declare a "Mayday" and request an immediate return. As the undercarriage had

retracted, the nosewheel doors had operated out of sequence and fouled the bogie. Unsure of the situation and unwilling to continue, the crew elected to land back at Offutt as soon as possible. Repairs were made and XH499 returned to the UK, via Goose Bay, on November 19, landing back at Scampton on November 20 after a weather diversion to Lossiemouth. The incident had left just one Vulcan to complete the circumnavigation to plan.

AROUND THE WORLD IN 50 HOURS

The sole successful Vulcan, XH502, pressed on to Goose Bay after hearing XH499's "Mayday", and finally landed at Scampton on November 8,





ABOVE The crew evacuate XH498 through the cockpit and down the port wing moments after the aircraft had stopped at Ohakea. The fire crews are on hand and the hoses from the fire truck are already being run out.

RIGHT The damaged port mainwheel unit after landing at Ohakea. The broken rod is visible, although the tyres appear to have survived the incident. The kiwi symbol was applied to the insides of both mainwheel doors on arrival in New Zealand. Vulcan XH498 was converted to B.1A configuration in 1962 with the addition of electronic countermeasures equipment and remained in service until October 1967, when it was given maintenance serial 7993M at Finningley and used – appropriately – as a crew escape trainer.

having flown 28,251 miles (45,465km) in 50 flying hours at an average speed of 565 m.p.h. (909km/h). Crossing the Atlantic, Bryn had been able to guide the Vulcan into the jetstream, giving an impressive ground speed of 720 m.p.h. (1,160km/h), or Mach 0.945, the Vulcan normally flying at Mach 0.84 or thereabouts. The crossing was made in a remarkable 2hr 49min 30sec, smashing the record. Avro was appreciative of the crew's efforts – but not overly so; each member received a copper tie pin with a Vulcan motif. The AOC, however, was presented with a silver model of a Vulcan by Avro's John Gray; rank has its privileges.

Much was learnt by the RAF as a result of the



antipodean adventure, in particular that the "V-Force" did not yet have effective global reach. The Middle East had to be avoided if possible, so a route across the Indian Ocean via Gan in the Maldives was used until the British armed forces withdrew east of Suez. Now if the RAF wishes to reach the Far East or Australasia in times of tension, the route is via the USA.



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It was left to XH502 to complete the circumnavigation tour, which concluded when the Vulcan landed back at Scampton on November 2, 1959. Later that year it participated in the four-aircraft scramble display at Farnborough, where it is seen here.



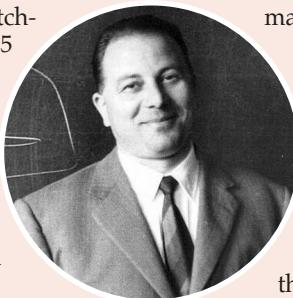


A diminutive white aeroplane hangs in the main foyer of the Milan Polytechnic's Bovisa campus — but don't try looking it up in *Jane's All The World's Aircraft*. The pocket-sized PR.2 of 1945 never made it into those hallowed pages — in fact, it is not known for certain whether it ever flew before its restoration in 2002. **GREGORY ALEGI** investigates . . .

...a 350lb Mystery

THE PR.2 SALTAFOSSI ("Ditch-hopper") was designed in 1945 by Dr Ing Ermengildo Preti (1918–86, seen at **RIGHT**), father of the CVV.6 Canguro glider and Iso/BMW Isetta minicar. Intended to serve the limited private market in war-scarred Italy, it was the smallest single-seater that could be built around a modified 20 h.p. MB.2 automotive engine.

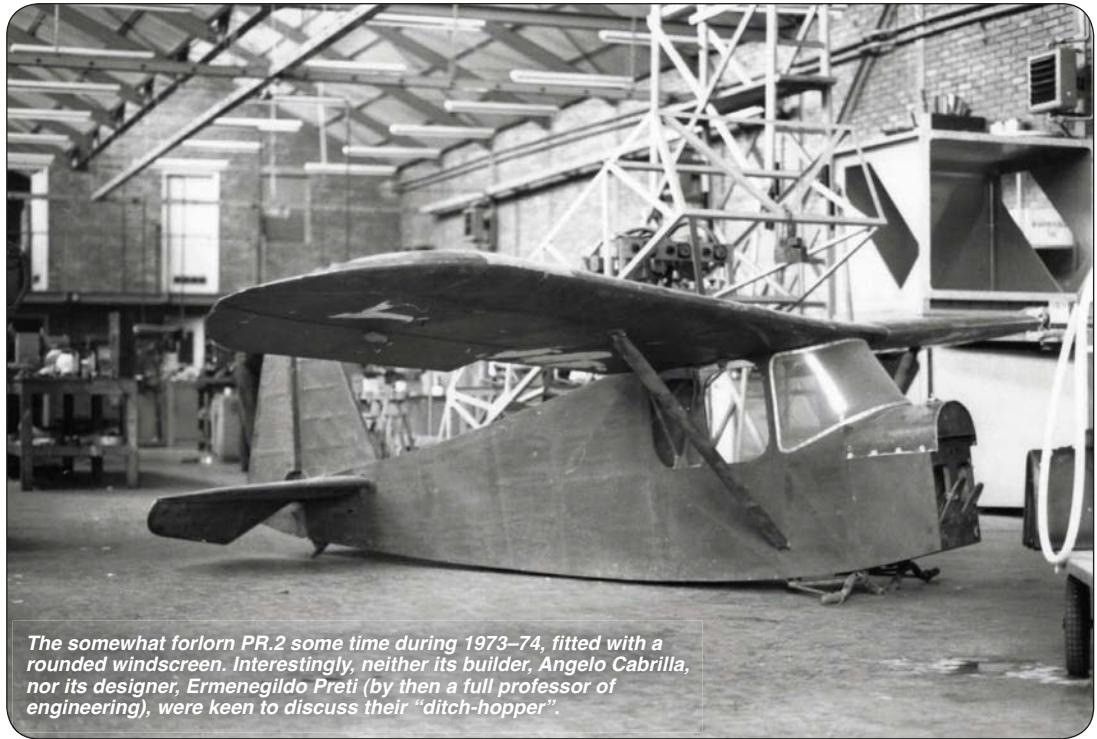
Its simple design sported a two-spar struttet high wing. Cockpit access was through the side window and roof hatch. The all-wood PR.2 was built by Angelo "Capo" Cabrilla in the Milan Polytechnic workshops. It was taken to Venegono Superiore, north-west of Milan, in the Lombardy region, for testing in 1946, where it is seen **ABOVE**, but there is no evidence of it having



made any flights there or been registered. In 1988 the tired airframe, stripped of most metal parts, was passed to the Italian restoration specialists *Gruppo Amici Velivoli Storici (GAVS) Lombardia* for restoration to fly. The work was completed by Giancarlo Zanardo, who coaxed it into the air on October 21, 2002, and thereafter made a handful of flights in it over the following few months.

"The PR.2 has no flaps, which means take-off and landing takes up to 300m [985ft]", says the experienced homebuilder. "It flies well, with good controllability, but the aerofoil really needs 60 h.p." The 2002–03 flights required two new propellers to harness the 45 h.p. DAF engine — compelling evidence that it could not have flown in 1946.





The somewhat forlorn PR.2 some time during 1973–74, fitted with a rounded windscreen. Interestingly, neither its builder, Angelo Cabrilla, nor its designer, Ermenegildo Preti (by then a full professor of engineering), were keen to discuss their “ditch-hopper”.

PR.2 Saltafossi data

Powerplant (1946) 1 x 20 h.p. MB.2 automotive piston engine; (2002) 1 x 844 c.c. flat-two DAF 44 automotive engine of 30 h.p. at 3,800 r.p.m., 40 h.p. at 4,500 r.p.m.

Dimensions

Span	21ft 8in	(6.6m)
Length	15ft 0in	(4.55m)
Wing area	75ft ²	(6.98m ²)

Weights

Empty	353lb	(160kg)
Maximum	507lb	(230kg)



ABOVE
Preti's Iso Isetta minicar design was introduced in 1953, and went on to be licence-built in Spain, France, Germany (by BMW), Brazil, Belgium and the UK. BELOW It will fly! The PR.2 aloft during one of its series of short post-restoration flights in 2002–03.



PIONEERING THE FIGHTER

Part 2: From S.E.2 to S.E.4 and beyond



MAIN PICTURE An excellent photograph of the S.E.4 in its initial form at Farnborough, with the Royal Aircraft Factory buildings as a backdrop. The single interplane I-struts were anchored to the front and rear main spars of the wings.

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Resuming the story begun in *TAH3*, **PHILIP JARRETT** concludes his two-part account of the Royal Aircraft Factory's innovative high-speed scout and fighter aircraft of the pre-and early-First World War era, the progenitors of the famous S.E.5 family. In this final half he recounts the development and testing of the S.E.4, one of the most advanced aircraft of its time, and the S.E.4a, the first of the series to be designed primarily for military use

ABOVE RIGHT *Henry Phillip Folland, assistant designer to Geoffrey de Havilland at the Royal Aircraft Factory, had a keen eye for sleek lines. This portrait was taken in the inter-war period.*

PHILIP JARRETT COLLECTION



A NOTE ABOUT REFERENCES As some of the sources used in the preparation of this history have not been cited for a century, endnote references, indicated by numbers at appropriate places in the text, are provided at the end of the feature



This two-part feature is based on a paper first presented as the Royal Aircraft Factory Centenary Lecture delivered before the Farnborough Air Sciences Trust Association at the Village Hotel, Farnborough, on May 22, 2012

TO TRACE THE further developments of the S.E. family it is necessary to go back to April 1913. Although expenditure of £2,050 for the planned S.E.3 biplane had been approved, it never progressed beyond the preliminary design stage. However, Henry Folland's early sketches and notes reveal that it was to have unstaggered equal-span wings, and single I-form interplane struts having spread ends that were anchored to the front and rear spars of both wings. The sketches also depict wing control surfaces that could be used differentially as ailerons, drooped in unison to act as lift-enhancing flaps, or reflexed to reduce drag at high speed.

Folland carried these features into his next design, the S.E.4 of 1914, of which historian Jack Bruce has said: "It might reasonably be claimed that the S.E.4 was, at the time of its completion, one of the most advanced aircraft in existence". The design's potential was foreseen as early as February 4, 1914, when Gen Sir David Henderson, speaking in the discussion following a lecture given before the Royal Aeronautical Society by Lt-Col F.H. Sykes, said: "If anyone wants to know which country has the fastest aeroplane in the world — it is Great Britain".

In his original sketches and notes for this design, Folland stated that its wings would have a "section same as S.E.2 also positions of spars", and estimated the empty weight at 1,082lb (490kg) and the all-up weight at 1,350lb (612kg).¹ Drag reduction and performance enhancement were

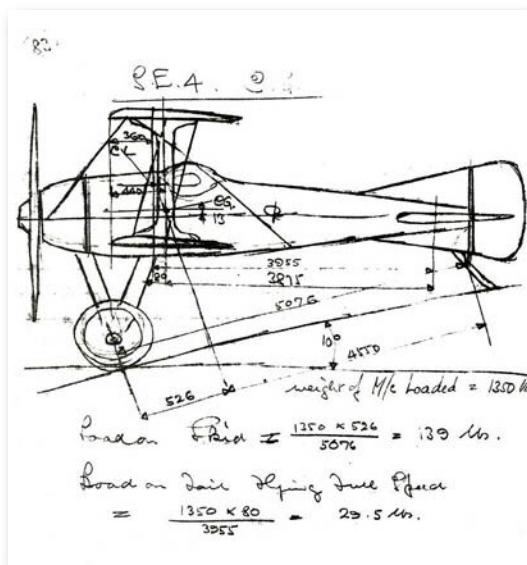
the prime considerations. The S.E.4's 160 h.p. Gnome 14-cylinder two-row rotary engine, mounted in similar fashion to the engine in the B.S.1/S.E.2, was completely enclosed in a circular metal cowling, and the four-bladed propeller was fitted with a large open-nosed conical spinner of slightly smaller diameter than the open front of the cowling, to admit cooling air to the engine. There was also provision for a small pointed internal spinner to be fitted to the front face of the propeller hub, to act as a centre-body and to direct more cooling air over the cylinders.

S.E.4 STRUCTURE

The basic structure of the fuselage was similar to that of the rebuilt S.E.2. The main box-girder element was built in two sections, front and rear, both having four longerons with spacers. The rear section had plywood webs on its upper and lower faces, eliminating cross-bracing, but the sides were cross-braced. Formers and stringers attached to the box girder were covered with ply skinning, giving the fuselage a tapering circular section.

The original Royal Aircraft Factory drawing² shows that the aircraft was to have a transparent cockpit cover, and a $\frac{1}{10}$ th-scale model of the whole fuselage with the cockpit cover in position was tested in the windtunnel at the Factory early in 1914 in four configurations: with fins and rudder straight; with rudder set over 10° ; with fins but without rudder; and with neither fins nor rudder.³

The complete lack of previous experience in moulding such shapes from celluloid meant that success was achieved only after several attempts. However, it was wasted effort; the transparency



ABOVE Folland's rough notebook sketch of the S.E.4 with his centre-of-gravity calculations, showing the transparent canopy intended to enclose the cockpit, which was tested on a windtunnel model but never fitted to the aircraft itself. FARNBOROUGH AIR SCIENCES TRUST

was never used, as no pilot could be persuaded to fly the aeroplane with the cover fitted. It would certainly have greatly impeded the forward view.

The unstaggered wings were of the same span as those of the S.E.2, 27ft 6in (8.4m), but incorporated the I-struts and control surfaces intended for the S.E.3. The ailerons occupied the entire trailing edges of the wing panels; they drooped and reflexed to act as flaps and to reduce drag respectively. (In the first half of 1914 windtunnel tests had been performed on models of "new

This three-quarter-front view of the S.E.4 shortly after completion clearly portrays the original inverted pyramid of struts to which the extremely narrow-track undercarriage was attached. Also of note is the open-nosed conical propeller spinner. FARNBOROUGH AIR SCIENCES TRUST





ABOVE The S.E.4's narrow-track undercarriage was soon replaced by a more practical vee-strut and cross-axle arrangement, as seen in this study of the aircraft after it had been given a singular camouflage scheme and had the military serial number 628 applied to its rudder. The pilot lends scale to the small but very shapely airframe.

forms of wing section with flaps extending over the whole length of the aerofoil". The S.E.4 doubtless embodied the results of this research.⁴⁾ The control cables were run internally, those to the upper control surfaces being led up inside the centre-section struts, the upper ends of which had similar wing-spar anchorage extensions to those of the interplane struts. The sheet-steel end fittings of the interplane struts were attached to the struts' main shafts by special flush-fitting bolts. The interplane bracing used streamlined Rafwires, the wings being rigged with an incidence of 2° 11'.

The tail surfaces closely resembled those of the S.E.2, although the tailskid mounting was simpler and apparently non-steerable. All the gaps between the fixed and moving surfaces were faired over with material that has been described as a form of elastic netting; however, as it was laced between the respective fixed and moving surfaces, the lacing might have been the elastic element.

The most conspicuous departure from the common practice of the time was in the main undercarriage. An inverted tripod of struts had attached at its apex a short transverse leaf spring, covered by an articulated fairing. The wheels were attached at the ends of the leaf spring, and were fitted with special tyres with carefully applied wheel covers designed to minimise drag. Although the resulting undercarriage was of extremely narrow track, there were no hoops or skids under the lower wingtips to protect them if the aircraft tipped over while manoeuvring on the ground.

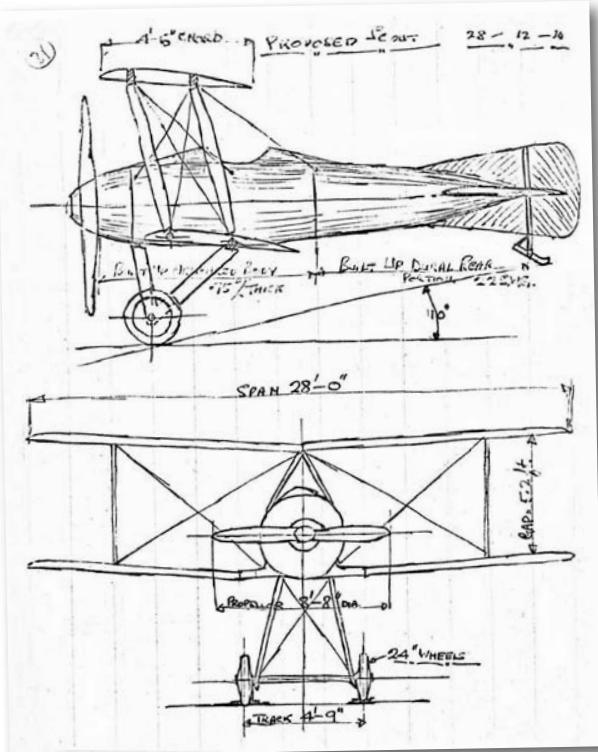
Construction of the S.E.4 was completed by June 17, 1914, as verified by dated photographs of

the finished aircraft.⁵⁾ Although it has been reported that it was tested by Norman Spratt that same month, it does not appear in the Royal Aircraft Factory Flight Book (which is "by no means exhaustive or infallible" according to J.M. Bruce) until July 23. On that day, "Mr Smith" (probably Factory test pilot S.C. Winfield-Smith⁶⁾ was at the controls for 5min of "rolling" (taxying).

Spratt was the pilot for most of the S.E.4's recorded flights. He made two 30min flights on July 27, a 40min flight on the 29th and a 25min flight on the 30th. It quickly transpired that the aircraft rolled too much on the leaf spring of the narrow-track undercarriage, and by July 30 the whole unit had been replaced by conventional cross-braced V-struts made from 14-gauge steel tube of 1 1/4in (3cm) diameter, fitted with wooden streamline fairings, with spreader bars and a bungee-sprung cross-axle. As Bruce points out, this date suggests that the S.E.4 was flown some weeks earlier with its original undercarriage, was then grounded for modification and underwent taxiing trials with its new undercarriage on July 23.⁸⁾

MILITARY POTENTIAL?

On August 4, 1914, the S.E.4 was flown for 15min by Maj J.M. Salmon (later Marshal of the RAF Sir John Salmon), to assess its military potential. As it was designed to have an endurance of only an hour and was purely intended as an experimental aircraft, its value in this respect was small. However, its performance was outstanding; it had a maximum speed of 135 m.p.h. (217km/h) and an extraordinary initial rate of climb of 1,600ft/min (488m/min), which meant



LEFT Another of Folland's sketches, this one for an armoured "Proposed Scout", dated December 28, 1914, displays distinct S.E.4 derivation, but the I-struts have been abandoned and replaced by a more conventional interplane strut system. The proposed wing chord was 4ft 6in (1.37m) and the track for the 24in (61cm) mainwheels was to be 4ft 9in (1.45m).

FARNBOROUGH AIR SCIENCES TRUST

OPPOSITE PAGE This Royal Aircraft Factory side elevation of the S.E.4a, drawing number A4501, dated September 27, 1914, shows it to be very different from the S.E.4. The somewhat oversized head fairing on the fuselage top-decking immediately behind the cockpit is conspicuous. The machine looks far more like a fighter than the unarmed high-speed scout that formed the basis of the original concept.

THE NATIONAL ARCHIVES, REF. AVIA 14/52/1/1

BELOW The precise cause of the S.E.4's crash on August 12, 1914, while piloted by Norman Spratt, is not known, but a forced landing on the rough Farnborough terrain might well have caused its starboard wheel to fail with the result seen here. The aircraft was not repaired. But for this unfortunate mishap, the aircraft may have joined the RFC in the field.

that it could have scouted over the battlefield without fear of challenge by enemy aircraft. Although Salmond thought the aircraft's 52 m.p.h. (84km/h) landing speed too high for Royal Flying Corps (RFC) pilots, he gave his approval for the S.E.4 to be acquired by the RFC. Consequently it was allocated the military serial number 628 and painted in a singular camouflage pattern.

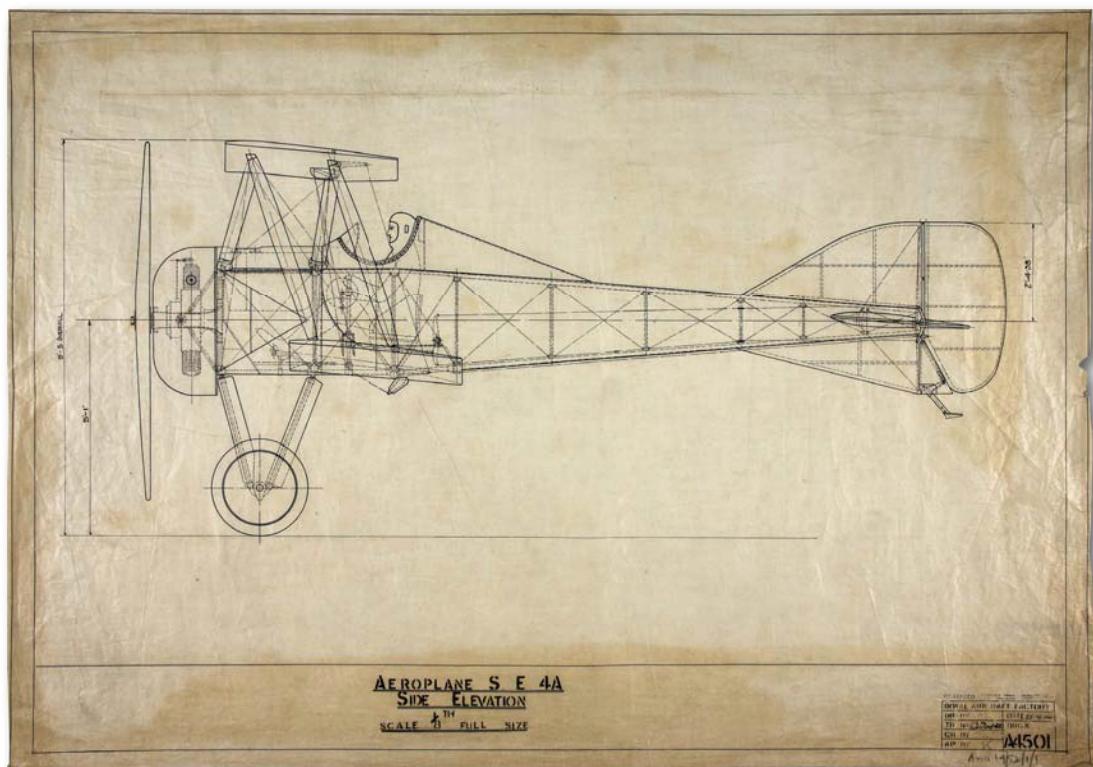
If there really was any intention to send the S.E.4 to join the RFC in the field, this was nullified on August 12, 1914. At 1145hr, after Spratt had been flying the aircraft for only 10min, he crashed

and the aircraft overturned, suffering extensive damage. The accident has been attributed to the collapse of a wheel at touchdown, but Spratt might have been obliged to make a forced landing on unsuitable terrain following an emergency or failure. Whatever the case, the S.E.4 was not repaired, work on a second S.E.4 was suspended, and an attempt to resume this work on November 19 was stopped two days later.⁹

In his book *Aircraft in Warfare* F.W. Lanchester wrote, with reference to the S.E.4 (two photographs of which appear in the book):

"One of the latest models turned out by the





Royal Aircraft Factory is by far the fastest machine in the world, being some ten or twenty miles per hour faster than anything the Continent can show. On the other hand, on the outbreak of hostilities we found ourselves without a thoroughly satisfactory fighting or gun-carrying type of machine — it is one matter to be able to mount a gun on an aeroplane, and quite another to design and construct machines expressly for that purpose. It is, indeed, doubtful whether at that date any really satisfactory gun-carrying aeroplane existed at all; it is in any case precisely in this direction that our own air service has found itself most lacking.¹⁰

Folland continued to follow the S.E.4 theme, and later in 1914 he sketched a "Proposed Armoured Scout" with similar lines. The forward fuselage back to behind the cockpit was to be covered with 24-gauge manganese steel, while the rear fuselage covering was duralumin. It had an estimated loaded weight of about 1,150lb (520kg), and its undercarriage incorporated a central skid and a claw-type anchor brake. The single-bay biplane wings, which were estimated to span 36ft (11m), had conventional pairs of interplane struts rather than the single I-struts of the previous designs.¹¹

On July 12, 1914, Folland also sketched a scheme for a "Variable Speed Propeller for Fast Machines",¹² and, on December 28 that year he drew a 28ft (8.5m)-span "Proposed Scout" with an 80 h.p. rotary engine. This had a built-up armoured forward fuselage with a skin 0.75mm

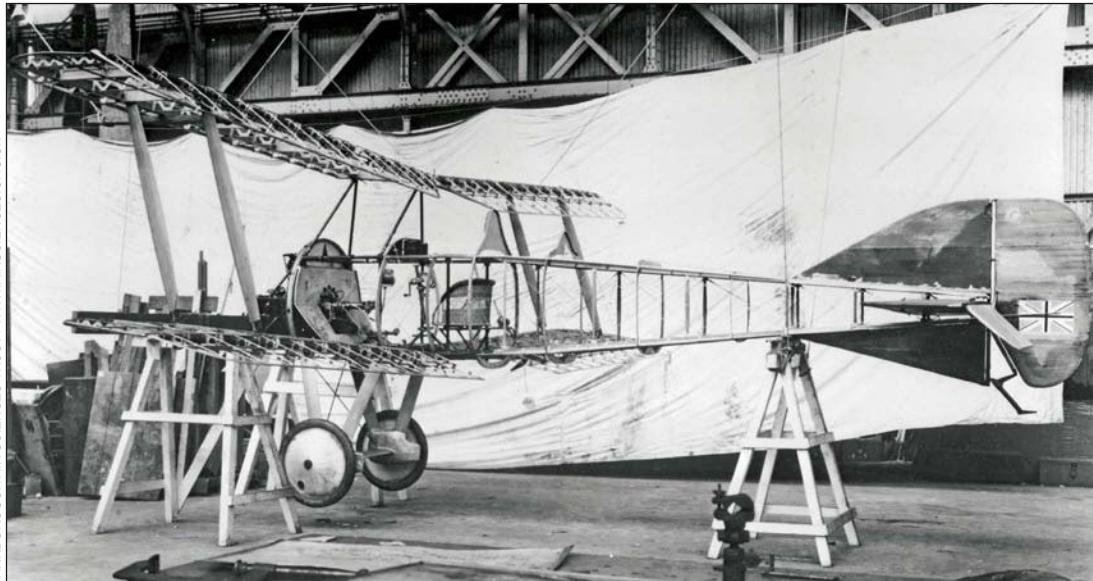
thick and a built-up duralumin rear fuselage. Its estimated loaded weight was an optimistic 1,200lb (545kg).¹³

THE S.E.4a

During the summer of 1914 work began on the design of the next aeroplane in the S.E. series. The fully detailed side elevation drawing is dated September 27, and the plan view October 6.¹⁴ Although it was designated S.E.4a, it generally bore scant resemblance to the S.E.4, being a rather neat single-seat, single-bay biplane scout of conventional construction, powered by an 80 h.p. Gnome.

While much of the work at the Factory up to this time had been concerned with the stable aeroplane, the S.E.4a was designed with the intention of acquiring information on both stability and manoeuvrability. So while its staggered wings had 3½° of dihedral, both the upper and lower wings had full-span ailerons incorporating a variable-camber system similar to that of the S.E.4. These worked as ailerons in response to side-to-side movements of the control column, while a handle mounted on the column enabled them to be raised or lowered simultaneously. There was no upper centre section; the port and starboard upper wing panels met on the centreline, where they were supported by a trestle-type cabane. The tail surfaces were of generous area, and carried unbalanced elevators and rudder.

The fuselage had again been the subject of windtunnel tests. Early in 1914 a 1/10th-scale model had been tested with and without fins and



ABOVE The first S.E.4a, 5609, under construction on June 8, 1915. The fins and rudder were already camouflaged, with the Union Flag painted low on the rudder, but it seems that when the rest of the aircraft's fabric covering was completed it was clear-doped, with Service roundels atop the upper wings and on the lower-wing undersurfaces.

BELOW The same aircraft on June 25, 1915, shortly after completion, with the overwing mounting for a single machine-gun in place. This machine retained some of the streamlining refinements of the S.E.4, such as the large propeller spinner and fairing of the fuselage to circular cross-section. FARNBOROUGH AIR SCIENCES TRUST

rudders and with the rudder set at different angles.¹⁵ The full-size fuselage was built in two sections that joined behind the cockpit. The front portion's longerons and spacers were of steel tube, whereas all of the structural members in the rear portion were of wood. Conventional cross-bracing was used throughout the front portion and for the sides of the rear portion, but plywood webs covered the upper and lower surfaces of the rear portion. The engine was carried on a steel-tube fore-and-aft mounting cradle, and a full circular cowling was provided. Armour plate to protect the pilot from small-arms fire was designed for the S.E.4a, but confirmation that it was actually installed remains to be found.

The main undercarriage was a conventional arrangement of inverted V-struts of faired tubular steel with a faired spreader bar at the base, housing the axle for the wheels, with bungee cord providing shock absorption. On the first aircraft close-fitting fairings surrounded the junction of the V-struts and spreader bar. The tailskid was hinged to the lower end of the rudder post.

The intention behind the design was apparently to incorporate some of the lessons learned with the high-speed experimental aircraft in a machine designed primarily for military use, in response to the need identified by Lanchester. Indeed, we know that Gen Sir David Henderson, the Director General of Military Aeronautics (DGMA), had



"The intention behind the S.E.4a design was to incorporate lessons learned with the high-speed experimental aircraft in a machine designed primarily for military use . . ."



FARNBOROUGH AIR SCIENCES TRUST

The third S.E.4a, 5611, at Farnborough on July 29, 1915, with an 80 h.p. le Rhône rotary engine installed. The engine was replaced by an 80 h.p. Gnome, which in turn gave way to an 80 h.p. Clerget. This was probably the longest-surviving S.E.4a.

been in contact with Lanchester for some time before the publication of *Aircraft in Warfare*, as, in the preface Henderson contributed to the book, he wrote: "During the past three years Mr Lanchester and I have had several tussles in private on the questions debated in this book".¹⁶

Moreover, it seems that production of the S.E.4a was considered, as on May 3, 1915, Lt-Col D.S. McInnes, the Assistant Director of Military Aeronautics, wrote to the Officer Commanding the Administrative, RFC, saying: "I am to inform you that for the purpose of official nomenclature the Royal Aircraft Factory-designed machines F.E.2b and S.E.4, now being put out to contract, will be known as 'Fighter Mark I' and 'Scout Mark I' respectively, and will be referred to as such in all communications concerning them".¹⁷ At this date McInnes could only have been referring to the S.E.4a, not the original S.E.4.

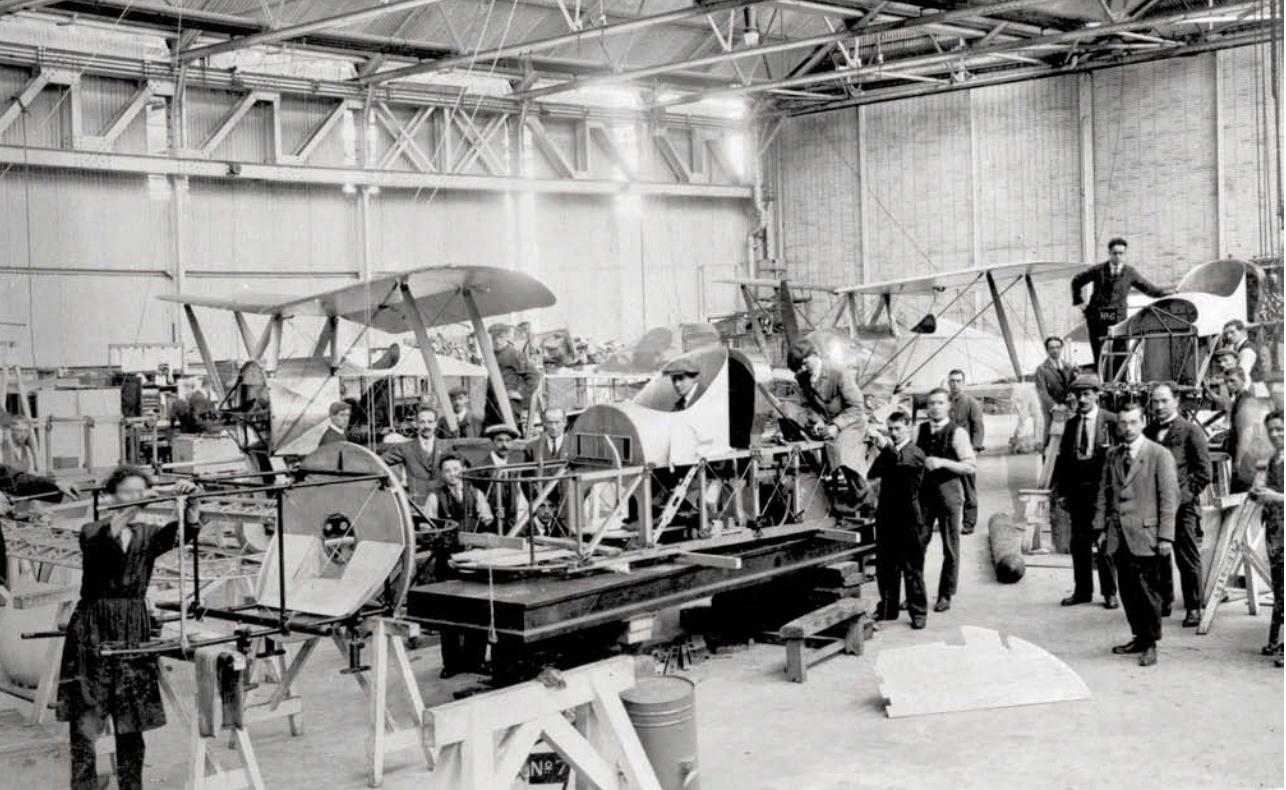
S.E.4a ORDERS

Four S.E.4as were ordered, serialled 5609–5612, and work on the first of these was well advanced by May 26, 1915, the day that its fuselage was inspected for true alignment. On June 23 the finished aircraft was submitted for pre-flight inspection. This machine inherited a number of streamlining features from its predecessors: its fuselage was faired to circular section with stringers and formers, and a large fairing was provided behind the pilot's head; the propeller was fitted with a large spinner that covered the engine and incorporated a multi-bladed fan to enhance

cooling; and the aileron cables were led internally through the lower wings, passing over pulleys before running up to the actuating cranks on the upper wings. The steel-tube members that passed through the lower fuselage to connect the lower wing spars were faired where they emerged into the slipstream. The S.E.4a was to be armed with a single machine-gun, apparently a 0.303in Lewis, and on 5609 it was to be mounted above the top wing, firing forward above the propeller arc.

Test pilot Frank Goodden made the 10min maiden flight of 5609, which had an 80 h.p. Gnome, on June 25, 1915. After a number of other flights piloted by Goodden and Stutt, and several changes of engine, it was last recorded at the Factory on September 6, 1915.

The second S.E.4a, 5610, which also had an 80 h.p. Gnome, was typical of the last three of the type, conforming to the basic design and having fewer concessions to streamlining. It had no spinner, a fully cambered engine cowling, and semi-conical fuselage-flank fairings behind the cowling to smooth the transition to the unfaired flat-sided fuselage. The projecting steel-tube members linking the lower wings were uncovered, allowing the pilot a limited view downwards, and the aileron cables and pulleys were run externally, small fairings covering the exposed pulleys on the lower-wing upper surfaces. It underwent pre-flight inspection on July 12 and first flew on July 21, piloted by Stutt. It was subsequently flown on 16 occasions at Farnborough by Stutt and once by Goodden between



ABOVE The second and third S.E.4as, 5610 and 5611, under construction in the F.1 Shop at Farnborough on July 15, 1915, with the forward fuselage of the fourth and final S.E.4a, 5612, in the left foreground. A couple of nacelles for F.E.2a pushers are also under construction in this fascinating photograph. FARNBOROUGH AIR SCIENCES TRUST

July 21 and August 20. It visited Upavon, home of the Central Flying School, on August 9. By September 8, 1915, it was at Joyce Green Aerodrome, an RFC Home Defence station near Dartford in Kent, for on that day it flew from there to Norwich, returning the following day.

The third S.E.4a, 5611, powered by an 80 h.p. le Rhône, had a thorough inspection on July 23 and was flown by Stutt on the 27th. By September 2, 80 h.p. Gnome No 2758 had been installed. Between December 1915 and June 1916 this machine disappears from the Farnborough records, but it was reported as flying at the

Factory on June 26, 1916. When it was inspected on October 11, 5611 had an 80 h.p. Clerget, but it is not known whether this engine was retained. In September 1917 it completed a series of accelerometer test flights begun the previous month, and was probably the longest-surviving S.E.4a, being flown by such illustrious pilots as Frank Courtney, Roderic Hill (later Air Chief Marshal Sir Roderic Hill) and Dr F.A. Lindemann (later Lord Cherwell).

The last S.E.4a, 5612, had its final inspection on August 9, 1915, and both Goodden and Stutt flew it on the 13th. After being flown twice by Stutt on



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LEFT Another view of the third S.E.4a, 5611, showing the rather more utilitarian slab-sided fuselage of the later examples, with semi-conical fairings to fair the circular engine cowling into the fuselage sides.

OPPOSITE PAGE A rare early air-to-air photograph of Frank T. Courtney flying an S.E.4a over the Royal Aircraft Factory's distinctive buildings in August 1916, during his few months as a military test pilot at the Royal Aircraft Factory. The photograph was taken from an aircraft flown by Frank Goodden.

PHILIP JARRETT COLLECTION





The third S.E.4a, 5611, in flight. Although the S.E.4a was said to be a fine aerobatic machine, the Factory's pilots were not enamoured of the flap gear, which did not improve performance sufficiently to warrant its general adoption.

the 17th it vanishes from the record. It might have been one of the two S.E.4as used at Home Defence stations.

An unidentified S.E.4a apparently served with the RFC at Hounslow, for on September 24, 1915, it spun in and crashed, fatally injuring its pilot, Capt Blood.¹⁸

TOWARDS THE S.E.5

An objective assessment of the S.E.4a's performance and handling is not possible, as no reports on these aspects are known. However, it was a well-proportioned aeroplane, and was said to be a fine aerobatic machine, despite being underpowered and overweight. Frank Goodden found it excellent for aerobatics, and his colleagues were delighted by his displays.

In the summer of 1916, presumably to verify the 1914 windtunnel model tests, the flap gear was tested by Factory pilots, who had already expressed

their dislike of it. Depressing the wing flaps by 12° reduced the stalling speed from 45 to 40 m.p.h. (72km/h to 64km/h), and reflexing them through 5° added a few m.p.h. to the top speed. Use of the flaps had no noticeable effect on trim, and there was no appreciable reduction in control.¹⁹ The figures suggest that the full-span flap system did not enhance performance enough to merit general adoption; it was not incorporated in subsequent designs, thus reducing weight and complexity.

The S.E.4a's potential as a fighter was never determined, and it was too early to have been fitted with a gun interrupter device that might have improved that potential significantly. But it marked the transition of the S.E. series from purity of line in the form of streamlined experimental high-speed machines to practical front-line combat aeroplanes, which would be epitomised by the Factory's next product, the



The first of a famous breed: A4561, the first prototype S.E.5, at Farnborough on November 23, 1916, in its initial form. Its first flight was made by Frank Goodden on November 22 that year.

PHILIP JARRETT COLLECTION x 2



ROYAL AIRCRAFT FACTORY B.S.1, S.E.2, S.E.4 & S.E.4a DATA

	B.S.1 (S.E.2)	Repaired S.E.2	Reconstructed S.E.2	S.E.4	S.E.4a
Powerplant	100 h.p. Gnome	80 h.p. Gnome	80 h.p. Gnome	160 h.p. Gnome	80 h.p. Gnome or 80 h.p. le Rhône or 80 h.p. Clerget
Dimensions					
Span	27ft 6 1/4in (8.38m)	27ft 6 1/4in (8.38m)	27ft 6 1/4in (8.38m)	27ft 6 1/4in (8.38m)	27ft 5in (8.36m)
Length	20ft 5in (6.23m)	20ft 10in (6.35m)	—	21ft 4in (6.5m)	20ft 11 1/2in (6.38m)
Height	8ft 4 1/2in (2.53m)	9ft 3 1/4in (2.82m)	—	8ft 11 1/8in* (2.74m)	9ft 5in (2.76m)
Wing area	190ft ² (17.67m ²)	188ft ² (17.48m ²)	188ft ² (17.48m ²)	188ft ² (17.48m ²)	—
Weights					
Empty	850lb (385kg)	720lb (326kg)	—	1,082lb (491kg)	—
Loaded	1,230lb (558kg)	1,132lb (513kg)	1,200lb (544kg)	1,350lb (612kg)	—
Performance					
Speed at ground level	92 m.p.h. (148km/h)	91 m.p.h. (146km/h)	96 m.p.h. (154km/h)	135 m.p.h. (217km/h)	—
Initial rate of climb	800ft/min (4m/sec)	—	—	1,600ft/min (8.1m/sec)	—
Endurance	—	3hr	—	1hr	—

* S.E.4 with original undercarriage; 9ft 10 1/2in (3m) with V-strut undercarriage

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- 18 The individual histories of the four S.E.4as are taken from Bruce, J.M., *Ancestors of the S.E.5*, part 2, op cit, pp436–437 & 441; and Bruce, J.M., *The Aeroplanes of the Royal Flying Corps Military Wing*, op cit, pp469–470
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Armchair AVIATION

We take a look at what's available for the aviation history enthusiast in the world of books and other literature, from brand-new hot-off-the-press publications to reissued classics

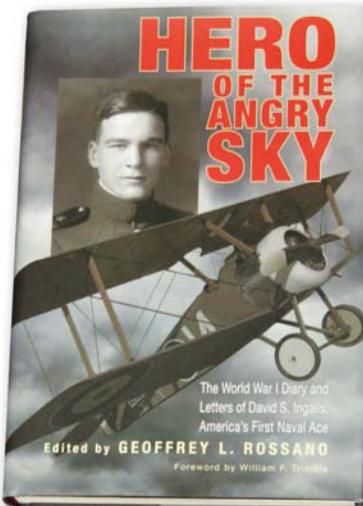
Hero of the Angry Sky: The World War I Diary and Letters of David S. Ingalls, America's First Naval Ace

Edited by Geoffrey L. Rossano; Ohio University Press, The Ridges, Athens, Ohio 45701, USA; 6½in x 9½in (158 x 235mm); hardback; 377 pages, illustrated; £24.50. ISBN 978-0-8214-2018-8

WORLD WAR ONE saw many technical innovations, military aviation being among the most important. Every combatant fielded some form of aircraft. By the time America entered the war in April 1917 aviation had grown by leaps and bounds that would have been impossible in peacetime. It took some time for the USA to get a sizeable number of soldiers and sailors to Europe and into combat. Many idealistic young men, however, could not wait and found ways of getting into the fighting long before the official entry. France's Lafayette Escadrille is perhaps the most famous of these early American-manned units.

A group of college students at Yale University was so intent on flying that they formed three units, two of which actually made it over to Europe in time to participate in the final months of the war. One of these young men, only 18 years old, was David S. Ingalls from Cleveland, Ohio. Leaving his comfortable life in the USA, he joined others of the First Yale Unit and trained with French and British units until he joined a Royal Flying Corps (RFC) squadron.

Dr Geoffrey Rossano has become an authority on American First World War naval aviation, having toured Europe looking for the remnants of the conflict's many aerodromes and small naval air stations, offering valuable and entertaining looks back at how things were nearly a century ago. His considerable research



also gives the reader a detailed view of early 20th Century youth, nascent American naval aviation and the young aviators who filled its ranks.

The US Naval Air Reserve will celebrate its centenary in 2016, and it all began with the young men of the First Yale Unit, of which Ingalls was a part. In this book we get a good chance to see London and Paris during the Great War through the eyes of the eager Americans who arrived to join the tired squadrons of the British and French air services in the final months of the devastating war.

Training and initial flights in advanced aircraft like the Sopwith Camel bolstered their confidence and experience as they prepared to enter combat for the first time. Ingalls's letters and diary also give the reader a real impression of what flying the demanding Camel was like. It was one of the most successful fighters of the war, but was tricky to fly and had to be treated with respect. Ensign Ingalls was the master of his mount, however, and it was only rarely that he had trouble with his borrowed fighter.

Ingalls's first missions, with No 13 Sqn of the Royal Naval Air Service (RNAS), were tedious anti-submarine patrols made during March–May 1918, but with the big German offensive — the last of the war — Ingalls and his friends were sent overseas to France and Belgium.

Throughout the book Ingalls's letters and diary entries paint a portrait of a young man experiencing what few people his age would ever do. He comes across as intelligent and opinionated, as many young men are, but also with the colour of early 20th Century life and beliefs. By the time he died in 1985 Ingalls had seen events change his comfortable world into something much darker.

By September 1918 Ingalls and his friends had made it to Dunkirk and flown their first combat missions with the newly-minted RAF squadrons in de Havilland D.H.4 and D.H.9 bombers. He was always happy and expectant; his letters home are full of youthful exuberance and it is hard not to smile while reading his accounts of flying, which he truly loved. Rossano has taken the young man's story well beyond anything yet published while also filling in a lot of missing information on the early activities of American naval aviation.

Moving to the RAF's newly created No 213 Sqn, Ingalls began flying fighter missions and getting his first kills. The question of Ingalls's aerial victories has been an ongoing concern, mainly because of the contemporary system of giving shared credit if more than one pilot was involved. If another aviator was seen to be firing at the enemy aircraft, he was also credited with a kill; two shooters, each got a kill. There has also been a question as to whether Ingalls achieved individual kills or just these confusing shared kills. In the appendix, Rossano lists all six of Ingalls's victories as shared, listing the other pilots and the serial number of Ingalls's Camels.

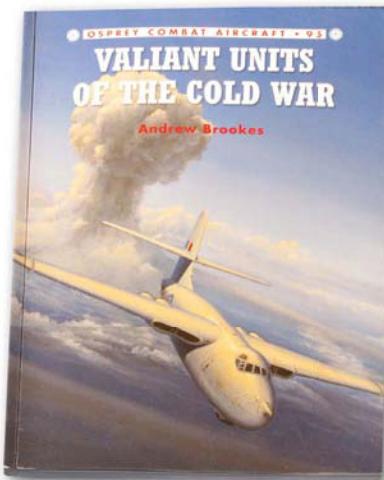
Some enthusiasts may be tempted to overlook American naval aviation in World War One; the USA was only officially in the four-year war for some 18 months; most aviation units and their aviators saw only a few months of actual combat before the Armistice of November 11, 1918. It is one reason why this book is so important.

PETER B. MERSKY

Valiant Units of the Cold War

By Andrew Brookes; Osprey Publishing, Midland House, West Way, Botley, Oxford OX2 0PH; 7½in x 9¾in (184mm x 248mm); softback; 96 pages, illustrated; £13.99. ISBN 978-1-84908-753-7

INCLUDED IN A job lot I acquired at a local auction some time ago was a coconut husk inscribed with the name of Ken Hubbard, and subsequent



investigation revealed him as the captain of the Vickers Valiant that dropped the first British atomic bomb, on May 15, 1957, during Operation Grapple in the Pacific. The husk was one of his souvenirs of this episode.

This volume has enabled me to learn a bit more about the occasion, and also about my favourite V-bomber. I always thought the Valiant was a well-proportioned aeroplane; one of those that "looked right" from the

beginning. In these pages the type's birth and development lead into its use in the 1956 Suez Campaign, the aforementioned nuclear trials, its roles as a trainer and inflight-refuelling tanker, its long-range reconnaissance capabilities, an overview of its service life, and, finally, its withdrawal from service.

In addition to the colour and black-and-white illustration amid the text there are nine pages of colour artwork side elevations and plan views. Naturally the majority depict various unit markings for all-white aircraft, but there are two camouflage schemes and one for the rather handsome all-black one-off Pathfinder Vulcan B.2 with its streamlined undercarriage nacelles.

PHILIP JARRETT

Interactive Gloster Gladiator for iPad

By Alex Crawford; MMP books (available from iTunes); for iPad using iBooks 2 or later, iOS 5 or later required; 471Mb; 96 pages, illustrated; £10.99



IT WAS ONLY a matter of time before aviation history publishers started to take advantage of the many recent advances in e-book technology. One of those blazing a trail in this respect is MMP Books, which has produced an "all-singing, all-dancing" version of its previously-released *Gloster Gladiator* title by Alex Crawford.

The good thing about this e-book is that it still works beautifully as a book. The

“bells and whistles” do not detract in any way from the experience of reading Crawford’s excellent text, only add to it. The first part of the text covers the development of the aircraft, followed by a comprehensive history of its service, theatre-by-theatre and operator-by-operator. In this section of the book, the interactive features gently complement the writing; these include “albums” of photographs illustrating a particular element of the aircraft’s history, diagrams of a variant relevant to the narrative at that point, or appropriate colour artwork that may be viewed as thumbnails or blown up to full screen size.

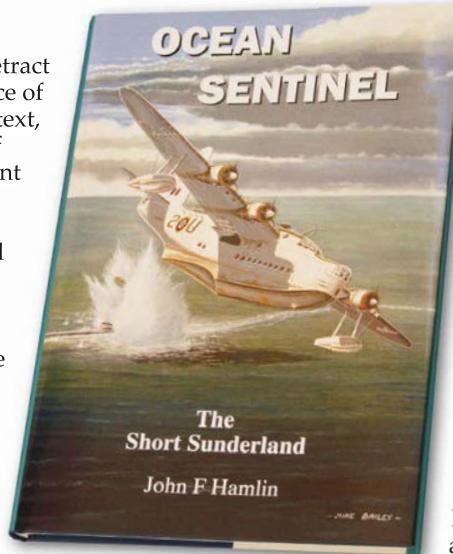
There follows an extensive photographic record of surviving Gladiators, with accompanying text by James Kightly. The latter part of the book, which deals with the technical detail of the aircraft, is where the format really comes into its own. This section includes rotatable three-dimensional diagrams of elements of the airframe, highly detailed high-resolution computer artwork, more albums of photographs and even film clips. These features are likely to be of great use to modellers, as the reader has a large-scale fully accurate model to refer to whenever required. The use of movable art and short pieces of film, subtly inserted into the text, finally surmounts the age-old problem of trying to describe a very dynamic subject in what is an essentially static medium.

MATTHEW WILLIS

Ocean Sentinel: The Short Sunderland

By John F. Hamlin; Air-Britain, 41 Penshurst Road, Leigh, Tonbridge, Kent TN11 8HL; 8½in x 12in (216mm x 305mm); hardback; 224 pages, illustrated; £39.95, or £29.95 to Air-Britain members. ISBN 978-0-85130-400-7

THE SUNDERLAND HAS always had an enthusiastic following, so it is good to see it being adopted as the subject of an Air-Britain monograph. Other books on the type have recounted many of the episodes from the imposing flying-boat’s Service career, which lasted from 1938 to 1959, but this volume provides far more complete coverage, including the post-war civil conversions and Sunderland-



derived new-build aircraft.

The opening chapter on development and production is followed by an “operational overview”. This in turn is succeeded by the relevant histories of all of the British and Commonwealth units that operated the type, and after that comes a very complete listing of individual aircraft histories, including those used by the Royal Australian Air Force, Royal New Zealand Air Force, South African Air Force, France’s *Aéronautique Navale* and the Portuguese Navy, which possibly had two (there

is an unsolved mystery here).

Chapter six starts the sections on civil conversions and the Sandringham and Solent developments, accounts of worldwide operators preceding the individual aircraft histories. This is followed by 14 pages of colour; seven containing photographs and seven comprising 21 artwork colour side elevations. The book concludes with three appendices: Sunderlands listed by their military units; a listing of civil-registered Sunderlands, Sandringhams and Solents, individual aircraft names and surviving airframes; and finally a roll of honour of those who lost their lives in Sunderlands.

Presentation is good throughout (although one wonders whether there really is a need for a line space between every paragraph), and the black-and-white photographic images, of which there are a great many, are well reproduced on the glossy paper. This is good value at the non-members’ price; it is excellent value at the members’ price, which saves the buyer £10.

PHILIP JARRETT

The Men Who Breached The Dams

By Alan W. Cooper; Pen and Sword Books, 47 Church Street, Barnsley, South Yorkshire S70 2AS; 6in x 9in (156mm x 232mm); softback; 176 pages, illustrated; £12.99. ISBN 978-1-7815-9074-4

The Dambuster Who Cracked The Dam: The Story of Melvin “Dinghy” Young

By Arthur G. Thorning; Pen and Sword Books, 47 Church Street, Barnsley, South Yorkshire S70 2AS; 6in x 9in

(156mm x 232mm); softback; 178 pages, illustrated; £12.99. ISBN 978-1-8441-5667-2

WITH THIS YEAR marking the 70th anniversary of Operation *Chastise*, it was inevitable that there would be the release of a number of books to mark the occasion, several of which saw the light of day some years ago.

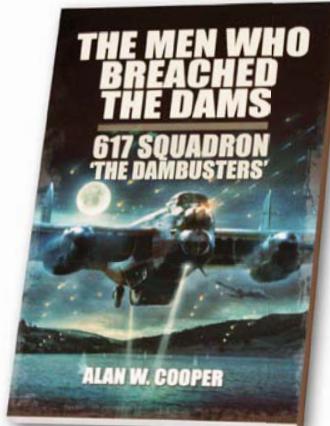
Alan Cooper's *The Men Who Breached The Dams* was first published in 1982, a few years after details of the *Upkeep* bomb were released from the Official

Secrets List and there was a resulting interest in the Dambusters. It provides a concise general history of the raid, but does not really live up to its title, as details of the individual pilots and aircrew taking part are sketchy and, apart from the obvious courage of those involved, there is very little to give a true picture of their real characters. Clearly, in a book of this length, it is virtually impossible to go into too much detail, but even a few thumbnail sketches would have made the book more personal. There are copious tables in the appendices, giving details of the aircraft involved and the service histories of the pilots and aircrew, and although they chronicle in detail the various postings and squadron service of the participants, they are merely the repetition of dry facts, not the revelation of who the men really were.

The analysis of the raid concentrates largely on a report of the German Intelligence Service, and the recollections of local civilians and military personnel who witnessed the event, and does not reflect the level of analysis found in other works dealing with *Chastise*.

The picture reproduction is of poor quality, with the images in many cases blurred and indistinct. In a way, this epitomises the book, since as a result they do not portray clearly and distinctly the men who are in them. At best, this is a skeleton history of the raid, and needs to be fleshed out considerably to provide a more fitting tribute to those who participated, particularly to those who lost their lives.

In marked contrast, Arthur Thorning's *The Dambuster Who Cracked The Dam*, a biography of Melvin "Dinghy" Young, first published in 2008, paints a



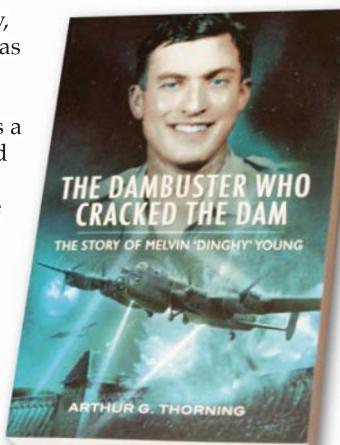
detailed portrait of the man who was Guy Gibson's deputy on the raid. Young, like Winston Churchill, was born to an English father and American mother, and showed the reserve and modesty (to the point of a lack of confidence) of his father's people combined with the determination of his mother's countrymen. His formative years were spent in almost equal portions in each of his parents' homelands and his experiences in both countries developed his tenacity and loyalty, both of which are well detailed in the narrative.

Although his nickname of "Dinghy" was probably bestowed on him with typical RAF humour because of his having ditched twice, he was an experienced rower; at Oxford University he was awarded a rowing "blue", being in the winning crew in the 1938 University Boat Race.

As was subsequently discovered when he underwent pilot training, he did not display a natural aptitude, but succeeded by sheer hard work and determination, which often involved stretching his abilities to the utmost. His early Service life in England and then in the Mediterranean theatre, especially Malta, are well narrated, including details of the hardships of experiencing several Luftwaffe raids a day. He first flew a Lancaster in March 1943, before being posted to No 57 Sqn at Scampton, where 617 Sqn was formed soon afterwards, "Dinghy" becoming one of the flight commanders. Guy Gibson wrote that he "had been responsible for a good deal of the training which made this raid possible. He had endeared himself to the boys".

During the raid on the Möhne Dam, Young and his crew were the fourth to attack, and their bomb weakened the structure to the extent that cracks were seen. The next bomb ruptured the dam. Young was shot down over the Dutch coast on his return; had he survived he would no doubt have been awarded a DSO to add to his DFC and bar.

The book is well researched, not only through personal interviews with friends and family of its subject, but also from copious letters and documents made available to the author. The result is to give the reader a real opportunity to experience what it may have been like to know "the dambuster who cracked the dam".



FRED CROSSKEY

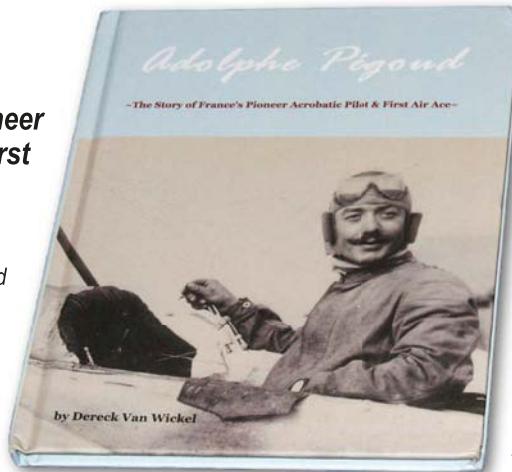
Adolphe Pégoud: The Story of France's Pioneer Aerobatic Pilot and First Air Ace

By Derek Van Wickel; self-published by the author and available via the blurb.com website (see www.blurb.co.uk/b/3718064-adolphe-pegoud); 10in x 8in (254mm x 203mm); 120 pages, illustrated; £27.21 softback, £34.21 hardback; no ISBN

AN INITIAL STUDY of this well-produced self-published book reveals that the author is evidently a postcard collector, as this is the origin of many of the illustrations. The author is honest about his work, describing it as a "biographical sketch" of its subject, the French pioneer of aerobatics, Célestine-Adolphe Pégoud, who also became the first "ace", gaining victories over six enemy aircraft during the early period of the First World War before his death on August 31, 1915, when he received a mortal shot from the machine-gun fired by the observer of a German two-seat reconnaissance aircraft.

As well as amassing an impressive collection of evocative period images of Pégoud and his aeroplanes, both on the ground and performing the loops and other stunts that attracted massive crowds of spectators, the author has gathered a good selection of related images, such as locations, military units and other characters featured in the story. The text is readable and generally accurate, although there are a few quibbles. For example, the nature of the Wrights' patent-infringement claims has evidently been misunderstood, the plan view of a Blériot XI on page 31 actually depicts the two-seat XI-2, and the crash of Orville Wright's Flyer on September 17, 1908, was not "aviation's first fatality"; some qualification is needed here. However, it is good to have an account, albeit brief, of this celebrated Frenchman's short career with the French air force, flying Blériots, Farmans, Moranes and Nieuports, which shows that he was just as courageous in combat as he was when throwing his fragile monoplane about the sky in peacetime.

PHILIP JARRETT



Who Goes Where?

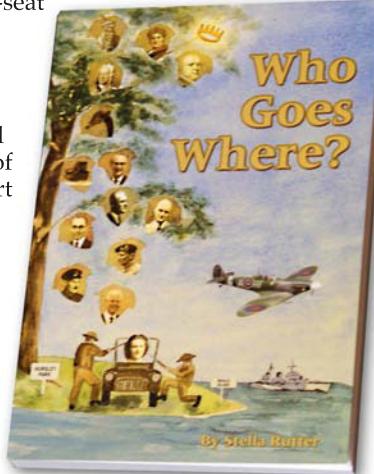
By Stella Rutter; self-published by the author; cheques to Stella Rutter, 31 Furlonge House, Emsworth House Close, Emsworth, Hants PO10 7JR, tel 01243 372746; 5¾in x 8½in (146mm x 216mm); softback; 200 pages, illustrated; £9.99 plus £2 p&p in the UK; ISBN 978-0-9556-6420-5

STELLA RUTTER (née Broughton) joined the Supermarine Drawing

Office in May 1942, having become bored with her work as a tracer at the Royal Navy Experimental Drawing Office in Portsmouth. Showing determination characteristic of this fiercely intelligent young draughtswoman, she contrived to secure a place at Supermarine's Technical Publications department at Hursley Park a matter of days before her call-up papers were due, having overheard in a telephone conversation that all girls born in 1923 were to be called up imminently.

Who Goes Where? is Stella's self-published family history-cum-memoir. It opens with 50 pages of detailed history of the Broughton and Towler families, which is outside the remit of this review, but the remaining 150 pages trace Stella's childhood and subsequent development into a gifted and tenacious draughtswoman, culminating in her selection to work at Supermarine as the only woman in an all-male drawing office. Divided into short, easily-digestible vignettes, the book goes on to relate Stella's recollections of meeting the great and the good, including Supermarine's Chief Designer Joseph Smith, who tasked her with making alterations to top-secret drawings of the Spitfire and Seafang.

It is the book's wartime section, which comprises roughly a third of the book, which will be of most interest to aviation enthusiasts, offering fascinating insights into the crucial work undertaken by the design offices tasked with constantly refining and improving Britain's war machines. Stella's fly-trap mind and dogged perseverance should be an inspiration to us all.



NICK STROUD



Lost & Found

PHILIP JARRETT explores the lesser-known corners of aviation history, discovering unknown images and rediscovering long-lost details of aircraft, people and events. Here he reveals an image of a Great War-vintage engine about which nothing appears to be known

I RECENTLY PURCHASED a very scarce loose-leaf *Aero Engine Data Book* issued by the Ministry of Munitions of War in 1918, comprising two volumes of data tables, photographs and drawings relating to a great many of the aero engines of the late First World War period. While perusing my acquisition I stumbled upon an intriguing item. All of the sections relating to specific engines were preceded by a tabbed index page, but at the end of the last Rolls-Royce entry, for the Condor, I discovered a lone, untabbed photograph of an engine that was completely unknown to me.

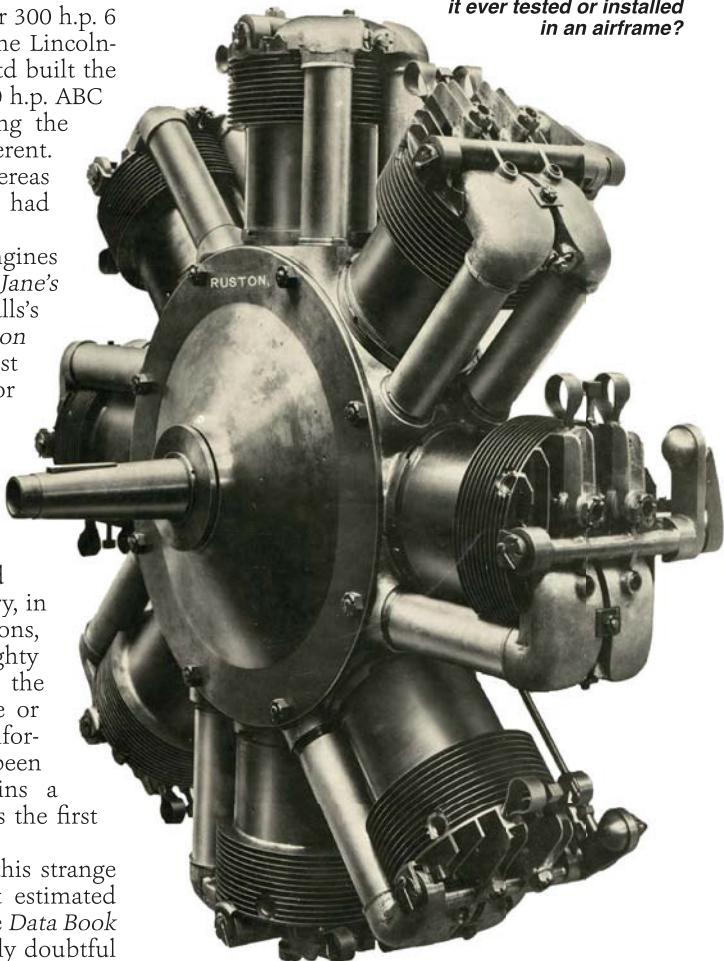
It is captioned as the "Ruston Proctor 300 h.p. 6 stroke". While it is well known that the Lincoln-based firm of Ruston, Proctor & Co Ltd built the 110 h.p. Clerget 9B rotary and the 340 h.p. ABC Dragonfly radial under licence during the war, this was definitely something different. For a start it had eight cylinders, whereas most single-row rotaries and radials had odd numbers of cylinders.

The usual reference books on aero engines and the 1918 and 1919 editions of *Jane's* yielded nothing, and nor did John Walls's little booklet *Ruston Aircraft Production* of 1974, so I checked in my two best engine books, both by American author Glenn D. Angle. The first, his *Airplane Engine Encyclopedia* (Otterbein Press, Dayton, Ohio, 1921), has a three-line entry: 'The Ruston Proctor engine was an experimental air-cooled geared rotary type, which operated on the six-stroke cycle, and was rated at 200 h.p.' The second entry, in *Aerosphere 1939* (Aircraft Publications, New York City, 1940), a large and weighty tome including a massive section on the "World's Aircraft Engines", says more or less the same but adds: "Further information regarding this engine has been unobtainable". Neither book contains a picture of the unit, so I believe this is the first time its likeness has appeared in print.

I would love to know more about this strange engine, and to determine its correct estimated horsepower. I favour the 300 h.p. in the *Data Book* caption, but anyway it seems extremely doubtful

whether an eight-cylinder six-stroke rotary engine would work very well. One friend thought it a "pipe dream" and "nonsense", and believed it was a totally impracticable concept. Can anyone provide any more information on this mysterious engine? As usual, if you have any further information, letters to the Editor, please.

BELOW This recently discovered photograph of the little-known Ruston Proctor eight-cylinder six-stroke geared rotary engine turned up in a recently acquired 1918-vintage Aero Engine Data Book. Who designed it, and was it ever tested or installed in an airframe?





BILL GUNSTON OBE

1927–2013

SADNESS SOAKED the aviation world in early June 2013, when the news broke that prolific veteran aviation author Bill Gunston had died, aged 86. It showed just what a significant presence he was in so very many lives — and on so very many bookshelves. He was credited with more than 375 published books at the last count, plus vast numbers of articles and radio/TV broadcasts.

So why did he make such a mark, and what sort of a man was he? Rather than recycle the conventional obituaries which appeared in the days and weeks after his death, we thought that a better way for *TAH* to offer a valedictory tribute would be to invite people he influenced — either as colleagues, family or readers — to remember him.

Bill's influence in the aviation world is neatly encapsulated by his grandson Brennan:

"I was told to look on the internet at what people are saying about Gramps passing. I knew he was respected in his field, but I had no idea how widespread was his influence. Words like 'genius', 'giant', and 'legend' appear throughout the tributes. But the word most widely used to describe him is 'gentleman'. That he was such a mentor and inspiration to those who followed in his footsteps is something I never fully realised."

One journalistic colleague, fellow *Flight* staffer Mike Hirst, recalls his old friend's manner:

"I read Bill's writing throughout my teens, and was delighted when he rolled up unannounced at my desk soon after I had joined *Flight* [in 1976], and regarded himself as so unassuming that he had to conduct an introduction. I had realised who he was immediately, and it wasn't so much a face that I knew, but a demeanour that spoke volumes. I discovered that he exuded a kindness and a gentle streak that corresponded to his writing style. Over almost 40 years that have since past, the goodness of the relationship that started that day never diminished."

What sparked Bill's prowess as a writer? Partly

it was those essential qualities of a good journalist: curiosity and fearlessness. Both attributes first manifested themselves in childhood — long before he became a writer — as remembered by his two daughters, Jeannette and Stephanie, and recounted by the former at his funeral:

"He was riding his bicycle really fast downhill on a lovely wide straight stretch of road. There was a rock in the road. He had plenty of time to avoid it . . . hmmmm, to the left, or to the right? . . . but yes, you guessed it, he rode straight over it, fell off his bike and skinned his knees."

The *Flight* years

Curiosity and fearlessness were to serve Bill very well when in 1955 he became Technical Editor of *Flight*. He quickly became renowned for "probes" — undercover technical investigations to produce detailed cutaway drawings. In an e-mail to Mick Oakey, then Editor of *Aeroplane*, in 2007, Bill singled out the late Frank Munger's cutaway of the North American F-100 Super Sabre:

"What readers may not appreciate is that these drawings were done with no collaboration with the manufacturer or anyone else. This is because, at the time, the F-100 was classified secret."

"In the mid-1950s we realised that it would be possible to create convincing cutaways solely from careful study of adverts in American magazines. We (mainly Frank, head artist Arthur Bowbeer and later John Marsden) often surprised ourselves by identifying pictures of such things as a wing rib, machined bulkhead or nosegear leg. One day our splendid boss, Wg Cdr Maurice Smith DFC, called me into his office. He introduced me to a man from the CIA and an Englishman (I think from Scotland Yard). After a formidable grilling, and production of lots of previously scattered evidence, they departed, and we heard no more. I still have a letter from Bob Hotz, Editor of deadly rival *Aviation Week*. He said, 'Your drawings make our security boys green . . .'"



ABOVE Just a small selection of some of the best-known titles from among the hundreds of books written by Bill Gunston over a career spanning seven decades.

Another important quality in a prolific author is decisiveness — knowing when to stop researching and when to get writing in order to meet a deadline. Bill was decisive in his professional life, but perhaps not in his personal one. Daughter Jeanette says that Bill "was lucky when he made three life-changing decisions, all of which worked out for the best and allowed him to make a career out of his hobby, his love of aviation. First, he left university to take up a full-time job. He never finished his degree, something that he regretted, but he never stopped writing and he loved it.

"Secondly, in 1964 he married his secretary — Mum [glider pilot Margaret Jolliff — 'They would have been married 50 years next year', says Bill's former *Flight* colleague Ann Tilbury-Harrington]. Mum looked after him completely, and gave him the security and freedom to live the life of a workaholic by taking care of *everything* else.

"The third decision he took was to leave his full-time job [at *Flight*] and go freelance as a

journalist . . . certainly Mum's parents were horrified that with a wife, two young children and a mortgage he had given up a perfectly good job for who knew what? He was lucky, and he knew it and appreciated it."

The generosity paradox

Among work colleagues Bill was gregarious, and curiously both generous and stingy at the same time. He gained a reputation for joining chums at the pub but leaving his wallet at home, as writer Arthur Ord-Hume recalls: "Bill had an unblemished record when it came to standing his round of drinks, for he never seemed to have any money with him and managed to avoid buying anybody a drink." Bill must have caught most of us out in this way at one time or another, but the twinkle in his eye made it impossible to take offence. And on the flipside, as Jeanette recalls, "He loved the company of people, and he welcomed everyone to our house. His legendary idea of hospitality



ABOVE The Flight team at the SBAC Show at Farnborough in September 1957. From left to right: Mike Ramsden, Maurice Smith, Bill Gunston, L.W. "Mac" McLaren, Ken Owen, H.F. "Rex" King, Mark Lambert and Alastair Pugh.



LEFT Bill (furthest right) in typical information-gathering conclave, with designers from the Soviet Union's Sukhoi bureau at the Paris Air Salon in 1989. Sitting to Bill's right is Mikhail Simonov, designer of the Sukhoi Su-27 "Flanker", one of the finest Russian fighters ever built; typically, Bill got his info "straight from the horse's mouth".

OPPOSITE A quartet of Flight Technical Editors at a reunion in 2009, the year of the magazine's centenary. Left to right: Bill Gunston (1955–1964), Mike Wilson (1965–78), Mike Hirst (1978–79) and David Velupillai (1979–84).

was to offer guests a gin and tonic. This always turned up in a pint glass! I don't remember anyone refusing the offer!"

His sociable nature meant that Bill seemed to have met virtually everyone who was anyone in aviation. He started early, as his obituary in the *Daily Telegraph* said: "As a ten-year-old he travelled to Germany with an uncle with links to British intelligence and shook hands with Germany's premier fighter designer, Willy Messerschmitt."

Bill did not meet quite *every* prominent person in aviation, though — one who slipped through the net is recalled by Richard T. Riding, Editor of *Aeroplane* from 1973 to 1998:

"When I started *Aeroplane Monthly* in 1973 Bill was first on my list of prospective contributors; his feature *Howard Hughes's Amazing Aircraft* ran for the first three issues. Part Three had an interesting sequel as it was published during the time when there were doubts that the recluse was still alive. Imagine Bill's surprise when he received a phonecall from Hughes's aide, Jack Real. He was told that the billionaire had enjoyed Parts One and Three but had somehow missed Part Two. How could Mr Hughes get hold of the issue? Thinking Real was calling from the USA, Bill offered to mail a copy. 'Why don't you bring it over?', suggested Real. 'Mr Hughes is staying here [in London] at The Inn on the Park'. Bill did just that, but the closest he got to Hughes himself was the adjoining bedroom!"

Bill was also a good builder of bridges, as aerospace PR consultant Richard Gardner recalls:

"Bill was the supreme professional author — no mere jobbing journalist — and at briefing events often would unobtrusively and patiently explain military terminology to puzzled hacks from the national or broadcast media when they appeared out of their depth during press conferences, which was frighteningly often! I worked closely with Bill later on when he was preparing what turned out to be a definitive book on the controversial history and rapid progress of Airbus, which was

then just about to introduce the new A320. The French Airbus community was, at that time, very suspicious of the UK press, which it regarded as following a generally hostile anti-European and pro-American attitude to aerospace joint projects, but Bill's deep aeronautical knowledge and quiet but robust factual approach soon won over the Toulouse-based Airbus PR team and he certainly helped change their view of the British press."

Royal recognition

A fitting recognition of Bill's abilities and status came in 1996. A recollection by fellow author and technical specialist Mike Gething, in a tribute to Bill at the Aerospace Media Awards in Paris in June 2013, also illustrated Bill's modesty:

"In the New Year's Honours of 1996, Bill was appointed an Officer of the Order of the British Empire for his services to aviation journalism. I remember ringing to congratulate him and asking if he knew what [the abbreviation OBE] meant. 'Other Buggers' Efforts!', was his response."

Bill's circle of colleagues continued to widen. Graphic artist and TAH Editorial Board member Ian Bott first worked with Bill when producing information graphics for *Aeroplane* in 2005:

"Illustrating for aviation publications has given me many treats over the years, but few of those treats compare with the opportunity it gave me to work with Bill, whose authoritative, inspiring and witty journalism had, years earlier, run through my teenage collection of aviation books and magazines in a rich seam. As our working relationship developed I particularly relished invitations to working lunches at his local where, over a pint or two, Bill would demonstrate his skills as a hilarious raconteur by drawing on a lifetime's worth of anecdotes. I'm so proud to have had the privilege to know him."

Aeroplane's then editor Mick Oakey shared those working lunches, and recalls: "I had first encountered Bill in my early years on the magazine in the 1980s, and I worked closely with him from



William Tudor Gunston OBE FRAeS, 1927–2013

1927 Born March 1 at Charing Cross, London
1945–48 Pilot in the RAF
1951 Joins *Flight* editorial team
1955 Becomes *Flight* Technical Editor
1964 Marries Margaret Jolliff
1969 Joins *Jane's All the World's Aircraft* team
1995–2007 Editor of *Jane's Aero Engines*
1996 Appointed OBE
2007 Given RAeS Decade of Excellence award
2013 Died June 1, aged 86

1989 when Richard Riding and I launched our offshoot publication *War in the Air*, comprising reprints of articles from *Flight* and *The Aeroplane* of the war years. We needed a columnist to comment authoritatively on each issue's content, correcting misconceptions and putting propaganda in perspective, and Bill was the obvious choice. We knew he was good at correcting mistakes, because I often used to receive letters from him itemising errors in *Aeroplane*. I hated it at first — it's never pleasant to be told you've got things wrong — but (a) I realised it was meant in the best possible spirit, (b) it's character-building and (c) it keeps you on your toes. So it soon became a great game, sparring back and forth about who was right and who was wrong."

Not just aviation ...

Bill was accurately described by *Pilot* magazine Editor Philip Whiteman as "the country's — and perhaps the world's — leading non-fiction writer in the aviation field". But it wasn't just aviation — as daughter Jeannette recalls, Bill "was a keen stamp collector, and he wrote *The Philatelist's Companion*, one of many books he published on a ridiculously wide range of subjects. He wrote about light, coal, submarines, rockets and missiles, the properties of metals, and he contributed to children's books on various science subjects. The only thing he didn't write was his autobiography — he just didn't want to talk about himself."

In 1979 Bill achieved a "personal best", working for 120 publishers in one year. But he still found time for other activities. Jeannette again: "He loved trains, had a footplate pass, and could travel in the driver's cab of any train — brilliant! He was a jolly good artist, and anyone who has been to our house will have seen the amazing white model aircraft that hang in the front hall."

The final word should go to a fellow writer who knew him especially well, Bill's protégé and close friend Dennis Baldry:

"Never meet your heroes. In June 1978 I didn't

really have a choice. Bill Gunston walked into the editorial office of *Flight International*, where I'd just started work as keeper of records. Who better to find some of the pictures Bill needed for one of the many books he was writing at the time? I was 20, and only too willing to help the man who had written the first book I'd ever bought with my own money: *Early Supersonic Fighters of the West*.

"On that Wednesday afternoon, Bill and I began a friendship that lasted until June 1, 2013. He was incredibly warm and modest; yet he exuded a certain charisma. When Bill talked, people listened, and intently, because it was obvious that he knew exactly what he was talking about. And he was uniquely engaging. In other words, Bill was fascinating — on and off the page.

"In 1981 Osprey Publishing head-hunted for a new editor. They needed someone who knew how to commission best-selling aviation books. They ended up with me. I was interviewed by Tim Parker, Osprey's dynamic automotive editor. 'Who's the next Bill Gunston?', he asked. My reply was immediate: 'There isn't one ... he's unique.'

"I promised TAH's Editor an anecdote. In about 1987 I managed to persuade Bill to visit RAF Binbrook in Lincolnshire. We were hosted by Flt Lt Ian Black, the last pilot to qualify on type at the Lightning Training Flight. Ian was waiting for us at the guardroom. 'Been here before, Bill?' 'Not since 1951, when the boss of 101 Sqn flew me to Frankfurt and back in a brand new Canberra.' After watching several Lightnings depart and recover, we repaired to licensed premises. We were joined by some of the junior pilots, one of whom — on learning that Bill was a former RAF pilot — asked: 'Have you ever flown a Lightning?' 'Which one,' came the somewhat mischievous reply, 'P-38 or English Electric?' I heard myself helping out the jp. 'He's flown them both, actually ... dual in a T.4, of course.' We all laughed. And then it was my round . . ."



MICK OAKLEY, with thanks to all who contributed



AUTHOR'S PHOTOGRAPHS

OFF THE BEATEN TRACK

Ever turned a corner to find something unexpected? The Aviation Historian's intrepid aeronautical explorer PETER DAVISON investigates the stories behind the oddities that turn up in the most unusual places

MALINLAND EUROPE has become famed for street art in recent years, where communal respect is shown for municipal sculptures and floral displays. Back in 1991, however, this was something of a novelty. Former Swiss Air Force de Havilland Vampire FB.6 J-1176 (c/n 685) was auctioned off in January 1991 following its withdrawal from service before being mounted creatively, and with a somewhat psychedelic colour scheme, at the entrance to the Salle Communale in Martigny at the foot of the Swiss Alps. Perhaps encouraged by the Vampire's success as a conversation piece and distinctive landmark, the town of Martigny established a policy three years later of sculptural enhancements for its roundabouts — some 15 installations now adorn the town.

Vampire J-1176 was one of the 178 examples built in single- and two-seat variants under licence in Switzerland during 1951–53. Most of their de Havilland Goblin engines were delivered in Swiss Junkers Ju-52/3ms. Many of the ex-Swiss T.55 two-seaters have found their way to museums and even into civilian hands.

ABOVE The Vampire's wooden fuselage, aluminium booms and flying surfaces appeared well preserved at the Salle Communale in Martigny when photographed by the author in 1991.

BETWEEN Not only may pedestrians enter the building between the Vampire's hallowed booms, its severed tailplane serves as a seat for the play area outside and provides opportunities for a "de-tailed examination".



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